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A RECORD OF CURRENT LITERATURE

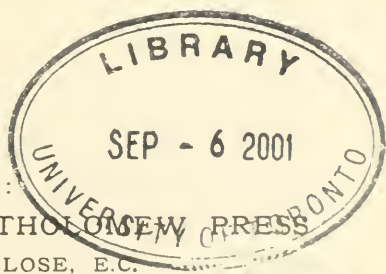
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**SEROUS OTITIC MENINGITIS, WITH SEPTIC THROMBOSIS
OF THE LEFT LATERAL SINUS AND INTERNAL
JUGULAR VEIN, SUCCESSFULLY TREATED BY OPERA-
TION.**

By E. MALCOLM STOCKDALE,

Surgeon to the Liverpool Eye and Ear Infirmary.

THE patient (J. R—), a boy, aged twelve, was first seen at the Liverpool Eye and Ear Infirmary on September 28, 1908.

History.—Constant discharge from both ears since three years of age, after scarlet fever. Had been treated at another hospital on and off for the past three years. A scar was present over the left mastoid region, due to a previous operation, and from the centre of this pus was freely discharging through a sinus. Thick offensive pus was present in both external auditory canals.

Complete post-aural operation (left) was advised.

October 19, 1908.—Complete post-aural operation (left) performed. The whole mastoid was found to be filled with inspissated pus. The malleus and incus had been previously lost.

After leaving the Infirmary the boy was not seen again until October 11, 1909, when he was brought to the out-patient room with a history of pain in the (right) ear for a week and a stiff

neck. A rigor had occurred two days before, and there was now tenderness over the right mastoid. He was admitted.

The following day at 4.30 p.m. he had a rigor lasting five minutes. Temperature 104° F., pulse 170, respirations 38.

Operation.—At 5 p.m. he was anaesthetised. Cerebro-spinal fluid obtained by lumbar puncture appeared normal. On exploring the right mastoid the bone was found to be extensively infiltrated with purulent material. The mastoid emissary vein was seen to be thrombosed, and the bone behind it to be of a peculiar yellow colour, with non-adherent periosteum. On exposing the lateral sinus its wall was found to be in a sloughing condition and its lumen filled with very offensive clot. On performing the radical mastoid operation the mastoid antrum was found to be small, the iter and tympanum were filled with granulations, the malleus and incus having been previously shed.

Lateral Sinus.—The infected clot in this blood channel was very offensive and extended half way towards the torcular Herophili. About half an inch beyond this the sinus was opened and plugged with cyanide ribbon gauze, free hæmorrhage occurring. The wall of the infected portion of the sinus was next freely incised and the clot cleared out as far as the jugular foramen. As there was no hæmorrhage from its lower end a dressing was applied, and preparations made for exposing the upper half of the internal jugular vein. The thrombus was found to extend beyond the point of junction with the facial vein, which was itself involved for fully an inch. The facial and some large lingual and thyroid veins were ligatured, and divided at some distance from the trunk. The internal jugular was then exposed as far as the inner end of the clavicle, where it was divided between two silk ligatures. It was then dissected up and sutured to the upper angle of the incision, but was not opened until the following day, when fætid black fluid escaped.

The skin incision was closed by silk-worm gut sutures, except at its upper and lower angles, where gauze drains were inserted, and healed by primary union.

For a few days after the operation the case was dressed daily under an anaesthetic, advantage being taken on several occasions to obtain specimens of cerebro-spinal fluid by lumbar puncture, the fluid on each occasion being clear.

Pathological Report on Cerebro-spinal Fluid by Dr. R. E. HARCOURT, Pathologist to the Infirmary.—“October 15, 1909: Micrococci present in the fluid. October 16, 1909: Culture of staphylococci obtained from above specimen. October 17, 1909: Similar

result from a second or control sample. October 18, 1909: A fresh sample was obtained. On examination immediately after withdrawal it was reported to contain micrococci."

The boy's temperature on this afternoon was 103.4° F. For three days the evening temperature had been rising and there was now distinct optic neuritis, this being more marked on the left side; twitchings of the arms and legs were also present, and the boy's general condition was getting worse.

Operation.—It was now decided to drain the sub-arachnoid space at once. Sufficient bone, much of which was yellow in colour, (necrotic) having been removed, a free horizontal incision was made in the dura and arachnoid above the position of the lateral sinus,



FIG. 1.—Cerebellar hernia.

and a (half inch) ribbon gauze drain inserted along the upper surface of the tentorium cerebelli, to the depth of about one inch.

A second incision, T-shaped, was made below the lateral sinus. Here a greater quantity of cerebro-spinal fluid escaped, and the cerebellum at once commenced to bulge into the wound. A cyanide ribbon gauze drain was inserted above the cerebellum, and a second between the cerebellum and floor of the skull, both being passed to the depth of about one inch.

During the ensuing week the boy took more interest in his surroundings, and his temperature improved, varying between 97.4 F. in the morning and 100-101° F. in the evening, but a cerebellar hernia had formed, and was slowly increasing in size.

On October 27, 1909, he was suddenly seized with violent general convulsions, which lasted from 3 p.m. to 6.30 p.m., and was quite comatose, with widely dilated pupils. He had vomited on the two previous days.

After seeing him I returned home, expecting to hear next morning that he was dead, but instead received a telephone message to say he was going on well.

By December 13, 1909, the hernia had reached the size of a hen's egg, and from a small aperture in the centre of it cerebro-spinal fluid had been discharging for three weeks. The escape was intermittent, but the leak was rarely absent for more than twenty-four hours. Nystagmus lateral and rotatory, equally marked on looking either to the right or the left side, had been observed for some



FIG. 2.—After excision of cerebellar hernia and plastic operation.

weeks. Slight paresis of the right arm and leg was present, with some inco-ordination of the movements of the right arm, including dysdiadocokinesis; Rhomberg slight, pupils equal and active, no optic neuritis, knee-jerks normal. Recently vomiting had occurred two or three times almost every day.

On January 5, 1910, it was found that he was unable to stand alone, falling towards the side of the lesion.

On January 19, 1910, I received a message from the House Surgeon (Dr. McWilliam) to the effect that the hernia had burst. On examination I found a transverse slit about $1\frac{1}{2}$ in. across, and there had been a free escape of cerebro-spinal fluid. The patient was somewhat collapsed, but not to an alarming extent. After a

consultation with my colleague, Mr. Hugh E. Jones, I decided to attempt the removal of the ruptured hernia, and to bring together the soft parts as a covering, in order to prevent its recurrence.

At 5.30 p.m. the same evening, chloroform having been administered, an incision was made around the base of the hernia, forming a groove for the reception of a silk-worm gut ligature. This was applied with a sliding knot (double twist), and slowly tightened, where necessary the knife being used to allow it to sink in. As it was subjected to considerable tension during tightening, and there was a risk of it breaking at the knot, a second similar ligature was applied, having its knot on the opposite side of the tissue to be removed.

As the operation proceeded, tightening of the ligatures began to be followed by alarming symptoms. First, the intra-cranial tension steadily increased, accompanied by marked pulsation of the brain. When this had developed to a certain stage, the patient rapidly passed into a state of marked collapse, becoming extremely pale, with pulse and respirations hardly perceptible, this being immediately followed by lowering of the intra-cranial pressure, arrest of the brain pulsations, and gradual recovery. The operation was proceeded with cautiously in stages, the intervals being used to freshen the edges of the surrounding scalp, and raise a flap with a view to covering the aperture in the skull and closing the wound. The hernia was finally sliced off just external to the ligatures, and these were further tightened. As the collapse now became very marked and sustained, further operation was abandoned for the time being, and the wound dressed. After receiving a hypodermic injection of ether, the boy was sent back to bed. On the following day, his condition being very satisfactory, it was decided to complete the operation. The silkworm-gut ligatures were further tightened, and having served their purpose, were, by a little manipulation, replaced by one of strong catgut. The scalp-flap was then completed and sutured in position. Two rubber drainage-tubes were employed, one being inserted through an incision in the flap.

Specimen.—The portion of the cerebellum excised consisted of medulla and cortex, which still exhibited well-marked convolutions and had a thick surface covering of plastic exudation.

Recovery was uneventful and complete, the removal of cerebellar substance causing no obvious defect.

Remarks.—It being observed immediately after incising the dura that the cerebellum bulged markedly into the wound, care-

ful pressure by bandaging was employed in order to prevent the formation of a hernia, but without success. Pressure from this cause may have originated the attack of violent convulsions.

The gauze strips soon ceased to serve as effective drains, and the secondary discharge of cerebro-spinal fluid always issued from a very small aperture situated at the centre of the hernia. This is not the position it would be expected to escape at if it came from the sub-arachnoid space. The position suggested that its origin was from the fourth ventricle. In a previous case under the care of my colleague, Mr. Hugh E. Jones, a very similar hernia followed the evacuation of a cerebellar abscess, and the museum specimen shows a tract communicating with the fourth ventricle. The mother of my patient reported in September 1912 (nearly three years after the operation), that he was quite well and working. No pad or bandage was used after the wound was firmly healed.

DIFFUSE OSTEOMYELITIS FROM NASAL SINUS SUPPURATION.

BY DAN MCKENZIE, M.D., F.R.C.S.E.,
Surgeon, Central London Throat and Ear Hospital.

"In the pleasant orchard closes
'God bless all our gains,' say we.
But, 'May God bless all our losses,'
Better suits with our degree."

DIFFUSE osteomyelitis of the bones of the cranium is one of the rarest complications of nasal sinus suppuration. But it is the commonest serious sequela of nasal sinus operation.

Within the last seven or eight years several important treatises on the disease have been published abroad, based, for the most part, upon collections of the isolated cases and groups of cases that have, from time to time, appeared in the medical periodicals. It is to the work of Schilling, Röpke, Gerber and Luc that we are indebted for these papers upon which our present knowledge of nasal sinus osteomyelitis so largely depends. So far as I am aware no systematic discussion of the disease has hitherto appeared in English. This hiatus in our literature is my excuse for the present disquisition on the subject, to which, as a matter of fact, my attention was first drawn by the occurrence of a case of the disease in my own practice.

History.

Prior to the antiseptic era, osteomyelitis of the skull was a common consequence of open injuries of the cranial bones. It is easy to gather, for example, from the case-narratives in such books on surgery as that of Fabricius Hildanus, that the disease must have been a familiar experience with the surgeons of the seventeenth century. Its true nature was, of course, unsuspected, and even its most striking feature, the association of pericranial abscess with extra-dural abscess, remained unknown until Percival Pott, in 1760, first drew attention to what came to be afterwards known as "Pott's puffy tumour." That these para-osseous abscesses depend upon a disease of the bone was first discovered by von Bergmann and Lannelongue in 1879, but it was not until nearly twenty years later, until 1897-98 to be exact, that the occurrence of osteomyelitis as a complication of nasal sinus suppuration was first detected by Tilley.¹ Before that event osteomyelitis of the cranial bones had been generally ascribed to some systemic malady of the septicæmic order, such as measles, typhoid fever, erysipelas, carbuncle, and so on. But since then the cases reported in the literature have been for the most part referred to nasal sinus or aural suppuration.

In 1904 Schilling's classical monograph appeared. It was based upon a series of nine cases, and of these only five were rhinogenic. In Gerber's collection the number of rhinogenic cases had risen to 29, while in Luc's paper, which appeared in the same year, 25 cases were collated, and as 10 of his records were additional to those of Gerber, the total number reached 39.

From that number I am compelled to deduct one, that of Dr. Scanes Spicer (1905, see appendix), which proved to be syphilitic and not septic in nature. And to that number I am able to add seven others from the literature, one reported by Logan Turner in 1905, and detailed in the appendix to the present paper; one by Van den Wildenberg in 1909; two by Von Eicken in 1909; one by Wolff Freudenthal in 1910; one by Charters Symonds in 1911; and one by Walker Downie in 1911. Finally, I report in the appendix three others; one a case under my own care; one a case of Mr. E. J. Davies; and the third a case of my colleague's Dr. Andrew Wylie. In Andrew Wylie's case the disease definitely originated in the maxillary antrum; and it is apparently the only instance recorded having this origin, with the possible exception

¹ Luc shares with Tilley the honour of this discovery, both of their cases being described in papers read before the British Medical Association in 1889. Luc's case occurred in 1898-99, however, the year after Tilley's.

of one by Claoué (1905), and another by StClair Thomson (1905).¹ Thus I am basing my remarks upon the records of 48 cases in all.

These figures do not, I am constrained to say, by any means represent the total number of cases of osteomyelitis that have occurred in the practice of recognised rhinologists within recent years, for there are very few specialists of position who have not, at some time or another, experienced one or more of these cases.

Pathology.

Septic osteomyelitis, which is, in reality, an infective inflammation, not of the marrow only, but of all the constituents of bone, presents several different varieties. The most familiar type is the osteomyelitis which attacks the vascular epiphysial line of the long bones during the period of growth. With this type before their minds, Schilling and the other earlier writers on sinus osteomyelitis of the cranial bones were inclined to draw a sharp line of distinction between the disease as it affects the long bones and the disease as it affects the skull. First of all, it was said, osteomyelitis of the long bones is a disease of childhood and early youth, while osteomyelitis of the cranial bones is most frequent in the second, and especially in the third decades of life. Again, osteomyelitis of the long bones was described as a circumscribed and self-limiting process, while osteomyelitis of the cranium is progressive and illimitable.

It is obvious that the antithesis here constituted lies between osteomyelitis of the epiphysial line of children, a common and well-known disease, and sinus osteomyelitis of the skull of adults, a rare disease. And the natural inference to be drawn from that antithesis is, that osteomyelitis when it affects the cranium behaves in a fashion altogether unlike its habit when it attacks the bones of the skeleton, and that osteomyelitis of the cranium is, therefore, a pathological entity separate and distinct in its nature from osteomyelitis elsewhere.

Such, however, is not the case. If we compare nasal sinus osteomyelitis, not with epiphysial osteomyelitis, but with another type of the disease, with what is known as "chronic diffuse osteo-

¹ We shall have occasion from time to time to refer to Claoué's and StClair Thomson's cases. They occupy a doubtful position in that the disease followed operation on the maxillary antrum, but appeared first in the ethmoidal and frontal regions.

myelitis" of the long bones, we shall find so many features (rarity, chronicity, intermissions, etc.), clinical as well as pathological, common to both, that the essential identity of the two processes will become visible at a glance. Whatever diversity may exist between them is due, not to any inherent and radical difference in nature, but solely to dissimilarity in environment and anatomical structure.

The most striking diversity lies in the fact that the diffuse osteomyelitis of the cranium is referable in the vast majority of cases to some contiguous infective focus in the ear or nasal accessory sinuses. (In this paper I propose to confine my attention chiefly to the latter.) "Idiopathic" cranial osteomyelitis has no doubt been recorded by several trustworthy observers, among others by Fischer and Schilling. (Schilling's case gave no evidence of tuberculosis or tabes; the ears were normal; and the disease was of a fulminating character, ending fatally in seven days.) But these idiopathic fulminating cases are extremely rare, and obviously do not invalidate the comparison we have drawn between chronic diffuse osteomyelitis of the long bones and nasal sinus osteomyelitis of the flat bones of the cranium, which also merits the title "chronic diffuse." To it we now turn.

The Sinus of Origin.—Of the thirty-eight valid cases collected by Schilling, Gerber and Luc, thirty-six originated in the frontal sinus and two in the maxillary antrum. If to these we add the cases appended to the present paper, we shall find forty-five originating in the frontal sinus and three in the antrum.

In speaking of osteomyelitis as originating in one or other of these sinuses, we do not mean to imply that the frontal sinus or the antrum was the only sinus diseased, for in nearly all of the cases the sinus suppuration was multiple, but, as the first sign of bone-disease appeared in the frontal bone or superior maxilla respectively no doubt is left in our minds as to the actual site of origin.

With regard to the ethmoidal cells as the starting-point of osteomyelitis, the only indication of such an event that I can find in the literature appears in Van den Wildenberg's case (No. 2 of my list; see appendix), in which a small sequestrum of the os unguis was first removed by the surgeon, and fourteen days later a large sequestrum comprising the crista galli and the lamina cribrosa of the ethmoid. In the reporter's opinion, however, the disease began in the frontal sinus. In one of Sir StClair Thomson's cases also the "traumatism caused by the Caldwell-Luc operation" was held to have "stimulated the latent suppuration in the ethmoid," as well

as in the frontal sinus. With these equivocal exceptions, the records are silent as to the onset of osteomyelitis from ethmoidal cell suppuration. Nevertheless in all probability a spreading bone infection starting in this region does occur. The proximity of the ethmoid to vulnerable parts of the meninges, however, will lead to the onset of meningitis before the disease in the bone can declare itself, or, at all events, before it becomes so obvious as to be readily recognised *post-mortem*, and the case will pass into history as one of an intra-cranial complication pure and simple, the osteomyelitis being overlooked.

A study of the literature, indeed, brings to light many cases in which the importance of osteomyelitis as the stepping-stone to the final stage of infection failed to obtain due appreciation. Guisez it was who first drew our attention to this error. He does not, however, apply his remarks to the ethmoidal cells.

As an illustration in defence of this reasoning we may cite the instructive case recently recorded in the JOURNAL OF LARYNGOLOGY, RHINOLOGY AND OTOLOGY by Dr. Gregory, of Highgate, in which a perforation of the cribriform plate, *the bony edges of which were discoloured*, led to the terminal event.

When we turn to the sphenoidal cells, we find here also an absence of any record of osteomyelitis. Whether or not the argument we have led concerning the ethmoidal cells is applicable also to the sphenoidal, time alone will show.

In considering the frequency of osteomyelitis as a complication of nasal sinus suppuration, it must not be forgotten that bone infection with caries or necrosis is frequently encountered in the bony wall of the sinus in which surgical intervention of a comparatively simple kind leads to rapid cure. But in these cases the disease is limited to the osseous walls of the sinus (the so-called *sinusitis abscedens*), and shows but little tendency to overstep these limits. In other words, this type of osteomyelitis is, as a rule, discrete and self-limiting. Consequently, it does not come under the heading of "diffuse" or progressive osteomyelitis, the outstanding and distinctive feature of which is the extension of the disease beyond the boundaries of the affected sinus.

Here, on the very threshold of our inquiry we are met with the question: Why is frontal sinus suppuration more prone to lead to osteomyelitis than is suppuration in the maxillary antrum?

Before we attempt to answer the question, let us examine the presumed fact. That frontal sinus suppuration leads to fatal osteomyelitis more frequently than does maxillary antrum suppura-

tion is certain. The figures we have given leave no room for doubt upon this score. But to the unrestricted question as to whether osteomyelitis, localised as well as progressive, is more common in the frontal sinus, the actual statistics at our disposal supply no answer. It is possible that localised osteomyelitis may occur not infrequently in the walls of the maxillary antrum, but that the anatomical and particularly the vascular arrangements about that cavity, permit of an easy cure of the disease. One may wonder, also, whether the fatal septic "pneumonia" which occasionally follows operation upon the maxillary antrum is not sometimes due to osteomyelitis and septic thrombo-phlebitis arising therefrom.

At the same time, while making every allowance possible for surmise and speculation, most rhinologists will, I think, agree that in their experience the frontal sinus is undoubtedly the more common site of origin of osteomyelitis, both localised and diffuse.

Further, most writers explain this emphatic preponderance by referring it to the readiness with which the infundibulum can be obstructed and the drainage of the cavity prevented.

Process of Infection.—As a matter of fact, from none of the cases so far recorded and described is there any information to hand regarding the route by which the bone received its infection from the suppurating sinus. This, the first stage in the evolution of the disease, still awaits demonstration. Consequently the opinions that have been formed about it largely depend upon analogy with similar processes of bone infection in the ear and elsewhere.

Two methods of infection are presumed; first, direct invasion by the organisms of the osseous spaces, canalicular and medullary, of the bony wall of the sinus; and secondly, primary infection of the small efferent veins of the lining membrane of the sinus with subsequent infection of the bone from the veins. In my opinion the former is the more important, but it is obvious that both methods may act in combination.

In the first method, that of direct infection of the bone from the sinus, it stands to reason that the pyogenic organisms may enter the bone if the defensive powers of the lining membrane are weakened or destroyed by pathological changes, or if the protecting barrier is removed by operative manipulations. As a result, a localised osteomyelitis will be produced. But, before the disease can become progressive and diffuse some other factor must come into play, otherwise osteomyelitis would be much commoner than

it is. Schilling and others are inclined to suggest that this factor may be found in the disposition of the diploë of the frontal bone with relation to the sinus. According to Schilling, the diploë abuts upon the walls of the sinus, as a rule at one place only; namely, in the neighbourhood of the upper recess where the anterior and posterior walls come together. Occasionally, however, the diploë will be found, on section, to extend down for some distance in the anterior, or, more rarely, in the posterior wall. Variations in this arrangement are often manifested in different parts of the same sinus (see Figs. 1 and 2). The proximity of the diploë in such

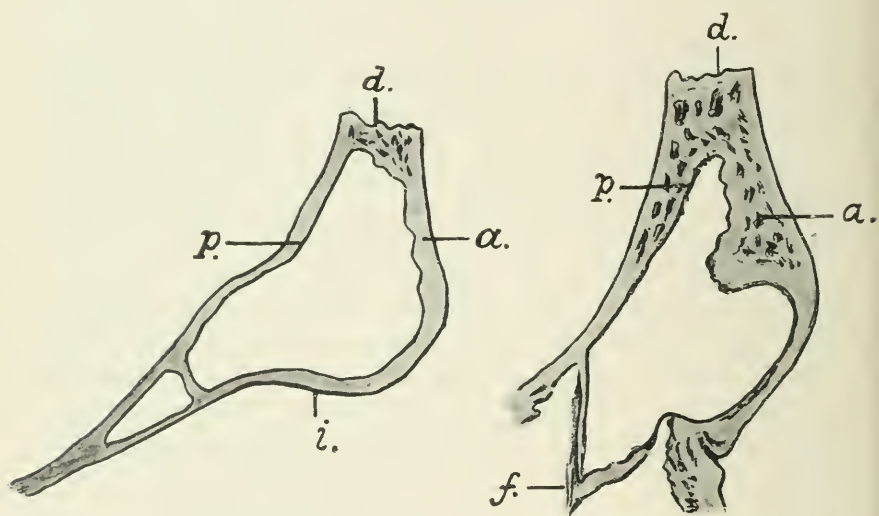


FIG. 1.

FIG. 2.

Sagittal sections through the same frontal sinus (from Schilling). *a.* Anterior; *p.* posterior; *i.* inferior, walls of the sinus; *d.* diploë; *f.* infundibulum.

cases to the diseased cavity, or its exposure when cut through by the surgeon, lays it open to infection, and the presumption is that those bones in which this anatomical arrangement holds good are thereby rendered specially liable to osteomyelitis.

In this argument, it seems to me, rather too much weight is laid upon the part played by macroscopically spongy or diploic bone. No doubt the infection is able to extend more rapidly when once the diploë has been reached, but in my opinion the essential spreading quality of the disease is not necessarily conditioned, and perhaps not even favoured, by the proximity or the exposure of the diploic medulla.

My reasons for this conclusion are as follows: Osteomyelitis

(that is, diffuse osteomyelitis) is not limited in its spread to diploic bone and to diploic bone only. As we shall see later on, the disease extends, not infrequently and quite early in its course, to involve the thin hard bones of the ethmoid, lachrymal bone, nose and orbit. Moreover, in its extension the disease does not spare the frontal eminences, where the diploic tissue is attenuated or altogether deficient. Finally, as every operator knows, a spongy or diploic structure of the anterior wall of the frontal sinus is by no means an uncommon finding, whereas spreading osteomyelitis is an extremely rare disease.

Indeed, one might just as reasonably assume that frontal bones of unusually dense consistence were, by reason of their very poverty in blood-vessels, more prone to undergo necrosis and to become the starting-point of a spreading osteomyelitis than those bones and parts of bones which are more highly vascular and so more able to oppose the invading organisms. And one could cite in support of this theory the relative infrequency of osteomyelitis in the maxillary antrum, the bone of which is thinner and more vascular than that of the frontal!

It should be remembered that osteomyelitis is an infection, not of the bone-marrow only, but of every constituent tissue of the bone.

So that—and this is, after all, tacitly admitted by Schilling and the other writers—the question is not one solely of the structure of the bone adjoining the sinus. Some other factor must be necessary (see “*Ætiology*”).

The second method of origin, that of infection through the veins of the accessory sinus, speaks for itself. But here, again, the existence of venous infection would not necessarily entail progressive or diffuse osteomyelitis. We recur to this topic below.

The Spread of the Disease in the Bone.—By what path soever the infection reaches the bone, it tends to spread, this, as we have so often remarked, being the essential characteristic of diffuse osteomyelitis; and the extent to which the cranial bones may become affected is practically unlimited. Thus in Tilley's case, the necrosis involved the whole of the cranial vault, and the infection spread down to implicate the petrous portion of the temporal bone. Similar findings are recorded in many other cases.

This unrestricted extension is generally attributed (partly, at all events) to thrombo-phlebitis of the diploic veins, and in support of this view there may be cited an interesting case of Laurens, in which thrombosis of the diploic veins was found far in advance of the general bone disease.

While venturing to express a doubt as to the importance of the diploë as the prime factor in the production of spreading osteomyelitis, I nevertheless admitted that the loose structure of the diploë and its medullary spaces must favour the rapid extension of the disease in any particular bone.

In like manner we may regard the part played by the veins. No doubt, when the infection reaches the interior of the veins its rapid extension is facilitated. And as the diploic veins traverse the cranial sutures the infection is thereby rendered independent of these barriers. But it must also be remembered that although the diploë is interrupted by the sutures, nevertheless in adult life there is direct continuity of the osseous tissue of all the bones of the skull, the sutures notwithstanding, so that apart from any venous route, the infection would be capable of passing from one bone to another across the sutures. For as we see, the skull is, for pathological processes, equivalent to one continuous bone, and it behaves as such. In a long bone chronic diffuse osteomyelitis is limited by the articulations. In the skull there are no such divisions, and the spread of the infection throughout the whole of the osseous structure, whether by dense bone or by veins, is not prevented by any natural impassable barrier.

That the infection makes a general advance and does not select any particular path is shown microscopically. In sections made of the bone at the edge of the disease in the frontal bone from Wylie's case, cocci (? staphylococci) can be seen in the Haversian canals under the periosteum, as well as in the diploic spaces and tissues.

Direction of the Extension.—As we have already indicated in one of the foregoing paragraphs, the spread of the disease is not limited to the cranial vault, although its favourite extension would seem to lie in the upward direction. But the nasal bones, the ascending process of the superior maxilla, the ethmoid with its cribriform plate (van den Wildenberg's case, No. 2 of my list), the delicate bones of the sides and roof of the orbit—any one or all of them may be invaded from above, and extension from the squamous to the petrous portion of the temporal bone is by no means unusual.

Pathological Anatomy : Macroscopic.—The affection of the bone is a purulent rarefying osteitis, or pan-osteitis, leading to more or less extensive destruction of all its constituent elements.

The appearances vary with the stage of the disease. In the earliest stage, such as is represented in the section from Wylie's

case referred to above, the bone presents no naked-eye abnormalities, although during life the diploë might perhaps show some congestion. In the next stage the diploë on section is seen to be markedly hyperæmic and to be interspersed here and there with drops of pus. This is followed by the conversion of the medullary tissue of the diploë into granulation-tissue bathed in pus, which, on section of the bone, exudes copiously from the cut surfaces. Sometimes thrombosed and purulent veins may be seen occupying channels in the osseous tissue. The purulent secretion, finding its way to the outer and inner surfaces of the bony cranium by the vascular channels which penetrate the osseous tables, collects to form abscesses between the bone and the pericranium on the one hand, and between the bone and the dura on the other—the *para-osseous* abscesses. There can be no doubt that pus may also form primarily in the deeper layers of the periosteal membranes, whether dural or pericranial.

The pericranium, raised off the surface by the accumulation, quickly undergoes dissolution, so that the abscess collection comes to lie in the soft tissues of the scalp. Here, however, no delimiting abscess wall is formed, although the pericranial abscesses are, when they are multiple, quite discrete and separate from each other. In this way are produced the doughy or puffy swellings of the scalp, which form a striking clinical feature of the disease.

Unlike the pericranium, the dura shows little or no tendency to break down, and, for considerable periods of time, it opposes a persistent barrier to the infection. This is one of the most interesting and instructive facts in the pathology of osteomyelitis, illustrating as it does the extraordinary powers of the dura to protect the soft membranes and the brain from the action of septic organisms, even after the more obvious osseous defences have been destroyed. Granulations sprout from the outer surface of the dura, and, aided by pseudo-membranous adhesions binding its deep surface to the arachnoid (Jacques), generally succeed in keeping the infection at bay. In some cases, comparatively few in number however, the local defences instituted by the dura are penetrated, and direct infection of the brain or its membranes ensues.

The formation of pericranial and extra-dural abscess precedes and accompanies the third stage of the disease, which consists in the destruction of the tables of the skull, the external usually giving way before the harder vitreous. By this time more or less extensive areas will have undergone necrosis, and, if time permits, they

proceed to exfoliate as sequestra, sometimes of a considerable size, but usually in small flaky fragments, which present the familiar eroded or worm-eaten appearance characteristic of bone undergoing molecular disintegration and absorption by granulation-tissue. In this manner the entire outer table may come to be shed, and during the process it looks "like lace-work" (Tilley), or

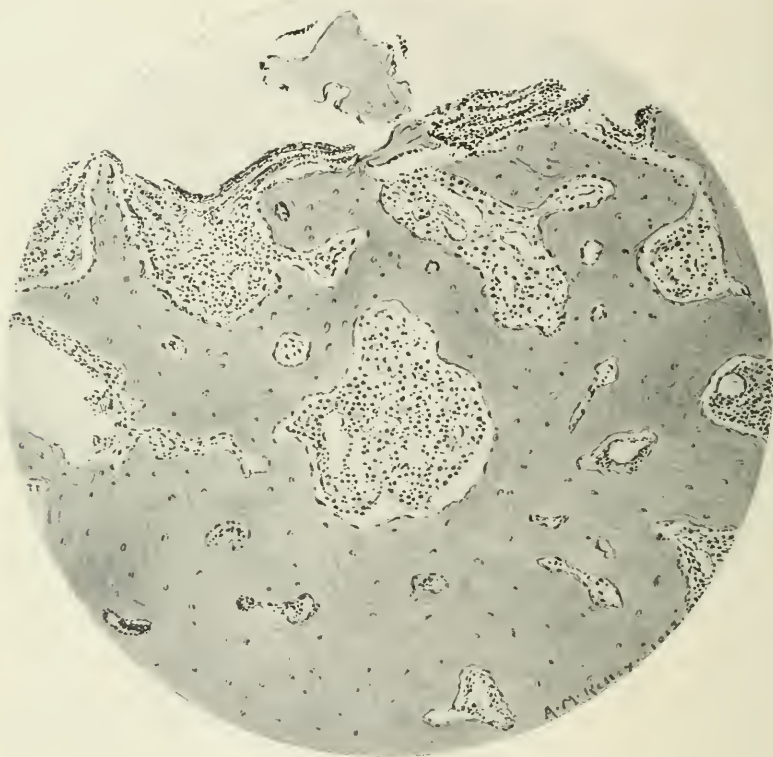


FIG. 3.—Diffuse osteomyelitis of frontal bone. Bone from neighbourhood of extra-dural abscess, showing round-cell infiltration of medullary and canalicular spaces. Erosion commencing.

as if it had been "corroded with an acid" (Luc), or small islets of necrosed bone may be seen lying in flat masses of granulation-tissue.

By the older writers the necrosis of bone was usually attributed to the isolating effect of the granulation-tissue masses, or to the separation of the pericranium and the dura, but modern pathology regards necrosis as an early event in the course of the disease, produced partly by inflammatory obstruction of the osseous vessels

in the rigid Haversian canals, and partly by the direct action of the bacterial products upon the cell element.

New formation of bone, which occurs with such rapidity and exuberance in epiphysial osteomyelitis, either does not appear at all, or is scarcely perceptible. On microscopic examination some little attempt at regeneration may be visible, but it is entirely overshadowed by the processes of destruction. Indeed, in this respect, as in many others, the reactive efforts of the tissues seem to be feeble and incompetent.

At the same time, it is only during the active period of the disease that this absence of regeneration is to be observed. In favourable cases, when the osteomyelitis has been brought to a final standstill by the natural or surgical removal of all the necrosed bone, the gaps made in the skull by the ravages of the disease are almost entirely filled up again by the formation of new bone.

Microscopically, early specimens show that the first changes consist in an invasion of the bone spaces by micro-organisms, with round-cell infiltration of the medullary spaces, the walls of which, at this period, are still quite smooth, or are only just beginning to show some signs of lacunar absorption (see Fig. 3). The later changes, which we may regard as secondary to the necrosis of the bone, consist in the replacement of the bone-marrow by granulation-tissue, with absorption, erosion, and finally disappearance of the bony trabeculae of the diploë. The outer and inner tables withstand the eroding action till a still later period, so that extensive sheets of granulation-tissue develop between the still intact, though lifeless tables. The blood-vessels contain thrombi more or less infiltrated with pus-cells, and signs of peri-vascular inflammation accompany the thrombosis when it progresses in advance of the general bone-disease.

Extension of Infection beyond the Bone.—We have already described the extension of the septic process from the bone to the neighbouring soft tissues of the scalp and to the extra-dural region. It remains to follow the infection in its migrations to other tissues and organs.

Metastasis to distant parts of the body is common in the osteomyelitis which follows accidental trauma of the skull-bones, but, curiously enough, it seems to be rather rare in accessory sinus osteomyelitis, whether spontaneous or post-operative. In this variety, to borrow an expression from the pathology of tumours, the malignancy is local rather than general. I have not been

able to find any more than five cases of definite metastasis in the records; in three of these (Macewen-Millar's, cited by Killian, Tilley's and Durand's) the metastasis was secondary to intra-cranial sinus thrombo-phlebitis, and affected the lungs only; in the fourth (Körner's case, No. 9 of Gerber's list, and No. 6 of Luc's) osteomyelitis of the radius occurred as a sequel to the cranial disease—the patient recovered; and in the fifth (Logan Turner's, No. 1 of my list) an abscess formed around the rectum.

Thus we have to deal mainly with local extensions.

The following table, based upon one constructed by Gerber, gives some idea of the variety and comparative frequency of the local extensions and complications. I have omitted pachymeningitis and extra-dural abscess as they have already been considered.

Subdural abscess	3
Thrombo-phlebitis (intra-cranial)	9
Brain-abscess	10
Lepto-meningitis	15

Thus the most frequent complication is lepto-meningitis. We have seen that lepto-meningitis in consequence of direct invasion through the dura of the vault is unusual. As a rule the stout resistance offered to the infection in that situation staves off this fatal complication for weeks. And meningitis only sets in when the infection, foiled in the frontal attack upon the dura, turns its flank by spreading to the temporal bone and the labyrinth (Schilling's case), or by invading the lepto-meningeal spaces through the nerve-sheaths of the orbit (my own case) or the cribriform plate. In a number of the recorded cases, the route taken by the infection to reach the lepto-meninges could not be determined.

The inference to be drawn from these facts is that the danger-zone lies towards the base of the cranium where so many natural portals pierce the cranial fortifications.

Brain abscess, unlike meningitis, is generally produced by direct extension through the meninges in the manner familiar.

Septic thrombo-phlebitis has been found to affect the superior longitudinal, the cavernous, the circular, the petrosal, and even the lateral sinuses. Its development is, of course, due to the extension of the thrombosis from the diploic veins. Breschet, Zuckerkandl and Killian have demonstrated the free anastomosis, often amounting really to direct communication, which exists between the veins of the frontal sinus, the diploic veins of the frontal

bone, and the superior longitudinal sinus. And Killian, in 1900, reported a case of thrombo-phlebitis of the superior longitudinal sinus as a complication of frontal sinus suppuration, and collected five others from the literature.

The venous sinuses at the base of the cranium are usually infected by way of the ethmoidal and orbital veins.

We may conveniently repeat here the remark we made in an earlier section that, since attention has been turned to nasal sinus osteomyelitis, we have come to realise that lesions such as those in the cases collected by Killian often really represent the terminal event in a spreading osteomyelitis. We make this comment without in any way throwing doubt upon the evidence in favour of septic thrombo-phlebitis being sometimes due to simple nasal sinusitis.

Care should be taken in performing autopsies upon such cases to note particularly the condition of the bone in and around all the nasal accessory sinuses, and to note carefully pericranial and extradural collections of pus—the sign manual of osteomyelitis. The patch of osteomyelitis may be so small as to escape anything but an expectant scrutiny, for the supervention of a fatal intra-cranial lesion may cut short the bone-disease in the very earliest stages of its development.

Bacteriology.

The bacteriological factor in diffuse osteomyelitis of the bony cranium cannot be satisfactorily discussed, for the very good reason that the causal organism is recorded only in eleven or twelve cases. Staphylococci (*albus* and *aureus*) are noted six times, streptococcus five times, and the pneumococcus once. There is an impression prevalent that osteomyelitis from the streptococcus is more pernicious than that due to the staphylococci, but the cases as recorded give no support to this idea. Luc at one time believed that he had had a case which exemplified the greater virulence of the streptococcus, but he has withdrawn the instance as the bacteriological finding, upon which his belief rested, turned out to be erroneous.

In the case of the long bones pathologists generally suppose that, while staphylococcus infection is the most common cause of osteomyelitis, any of the pyogenic organisms may induce the disease. And all the writers on nasal sinus osteomyelitis now agree that so far as the morphological type of the organism is concerned, no light whatever is thrown upon the aetiology of the

disease. The part possibly played by variations in the virulence of the micro-organisms we shall discuss in a later section.

Ætiology.

Sex.—Schilling found a preponderance of females in his nine cases, the ratio being 8:1. Gerber's proportion was thirteen females to fourteen males. The latter author discredits the value of these figures, seeing that, in osteomyelitis of the other bones of the skeleton, males are affected three times oftener than females. Until a larger assemblage of cases has been made and analysed Gerber's agnosticism may well be imitated, and until that time we shall defer discussing the theory which accounts for a female preponderance by referring it to the greater relative amount of diploic medulla in the female skull.

Age.—The following table has been made up from Gerber's, Luc's, and my own collections:

0-10 years of age	2 cases.
11-20	„	„	.	.	8 „
21-30	„	„	.	.	18 „
31-40	„	„	.	.	4 „
41-50	„	„	.	.	3 „
51-60	„	„	.	.	0 case.
Over 60	„	„	.	.	1 „

The danger of arguing from the particular to the general, an instance of which we quoted in the preceding paragraph, forbids us to accept these figures as a correct and reliable guide to the age-incidence of the disease. Moreover, the figures, small as they are, must be further subdivided into two separate categories—the spontaneous and the post-operative—before their significance can become evident. This I have done, and although but little weight can be placed upon the result, it is interesting to be able to report that in the second decade of life spontaneous cases preponderate, while in the third decade the post-operative cases form a small majority. Most operations on the frontal sinus are, of course, performed on patients between twenty and thirty years of age.

Schilling believes that age may exercise some moderating influence upon the course of the disease, and selects the difference in years as the reason for the great contrast in rapidity of extension shown by two cases in his collection. Both were ear cases. In the one, a child of nine months, the whole cranium became infected in a few days; in the other, a woman, aged 66 years (Laurens'

case), the disease ran a course of several months, and ended in recovery.

In starting out to discuss the ætiology of spreading osteomyelitis of the cranium from nasal sinus suppuration, we enter upon the most puzzling, and to us, as practising surgeons, the most important of all its problems.

From the standpoint of general pathology, there is no unusual mystery about the nature of the disease. Nasal sinus osteomyelitis is a septic process, which owes its existence to pyogenic organisms derived from a conveniently situated local focus. So much we know. But when we come to inquire how it is that some patients contract osteomyelitis and die of it; that others contract it and recover; while a third, and much the largest class, in spite, sometimes, of apparently dangerous circumstances, do not contract it at all—then we are confronted with a riddle which still awaits solution.

From a list drawn up by Gerber we learn that influenza, syphilis, trauma, dental disease, "cold," and measles have all been looked upon as having caused the disease, but as each of these is responsible for only one or two instances in his list of twenty-nine cases, we may pass them by as unworthy of further consideration. With regard also to "nasal obstruction and polypi," which is credited with five cases, nothing more need be said. This is only another way of expressing nasal sinus suppuration.

We have to deal with something very different when we come to the final cause in Gerber's list, namely, operation on the frontal sinus or maxillary antrum.

In order to obtain some idea of the significance of operation on the nasal sinuses in the causation of osteomyelitis I have submitted the cases recorded to a detailed scrutiny, excluding doubtful cases, and including only those in which the diffuse or spreading quality of the disease was unmistakable. Forty-one cases in all were deemed valid for the purpose. Of these:

- A. In twenty cases osteomyelitis developed after operation.
- B. In twenty-one cases osteomyelitis appeared spontaneously; that is, before any operation had been performed.

With regard to the post-operative class a word of explanation is necessary. In several of the instances recorded the disease did not appear until some weeks after operation, and it may be asked whether an interval so long does not exclude the operation from the possible causes of the disease. The doubt may be disposed of when we consider that progressive osteomyelitis is due to a

tenacious infection, capable of long periods of latency, and an incubation period of several weeks is quite in keeping with the general characters of the disease.¹

Again, it may be argued that the *post* has been taken for the *propter*, that the onset of osteomyelitis after operation is merely a temporal coincidence, and that the disease would have developed anyhow. But one has only to point to the figures in the above lists to destroy this contention. The proportion of twenty post-operative cases out of a total of forty-one proves the association to be more than a mere coincidence.

As to the nature of the operation that preceded the bone disease, I find that fifteen followed operation on the frontal sinus; two followed operation on the frontal and ethmoidal cells; and three followed operation on the antrum. In two of the records the disease was consequent upon such simple procedures as resection of the anterior end of the middle turbinal (Schilling's case), and removal of nasal polypi by the endo-nasal route (Roth's case).

The connection between operation and disease seems so remote in these two latter instances that one hesitates to regard them as belonging to the post-operative class, but even larger claims are made upon us by another series. The course of events in Claoné's and StClair Thomson's cases have led to the belief that operation upon one sinus, the maxillary antrum for example, may wake up osteomyelitis in another sinus, such as the frontal. The belief is not altogether acceptable, perhaps. In both of these cases an abscess of the floor of the orbit formed quite early in the course of the illness—a circumstance which suggests that the osteomyelitis in the frontal bone may have been secondary to osteomyelitis in the superior maxilla; in other words, that the frontal bone was infected by extension in the ordinary manner. But in a third case (van den Wildenberg's, No. 2 of my list; see appendix) the radical Killian operation on the *left* frontal sinus was followed in three weeks by osteomyelitis in the region of the *right* orbit. In this instance also, however, caution compels us to add that there is a note of an endo-nasal operation on the *right* side—date not mentioned. Thus in none of these cases is the documentary evidence quite unimpeachable. At the same time, the testimony of

¹ In one case, that of Mr. E. J. Davis (No. 9 of my list), I felt some hesitation. Three operations had been performed on the frontal sinus, the last in August, 1910. Osteomyelitis appeared in January, 1911. The interval seems to be too long for us to refer the disease to the operation. On the other hand, to call it spontaneous seems to be stretching a point. I have therefore placed this case among the doubtful cases.

the authors themselves is expressed quite distinctly on the side of the opinion that the osteomyelitis originated in a sinus untouched by the actual operative manipulations.

Further analysis of the 41 cases brings to light the following remarkable fact:

Of the 21 cases in which osteomyelitis developed spontaneously, 7 recovered after appropriate surgical treatment.

Of the 20 cases which followed operation not one recovered.

Spontaneous osteomyelitis, though not unknown in chronic sinusitis, more frequently follows the acute form, and, indeed, Guisez and other observers hold that the same is true of post-operative osteomyelitis—that is to say, that it is more prone to supervene after operation on an acute than on a chronic case.

As to the proportion of cases of frontal sinus suppuration which develop osteomyelitis spontaneously we have no figures to guide us. The number recorded is no indication of the frequency of the disease. On the one hand, spontaneous osteomyelitis, when fully developed, is sufficiently striking to secure recognition and sufficiently rare to lead generally to its publication. Against that consideration we must, on the other hand, remember that many cases are regarded as primarily intra-cranial which are, in reality, cases of osteomyelitis.

Further, these figures do not by any means fix the ratio between the numbers of spontaneous cases and of post-operative cases. If all the instances of post-operative osteomyelitis within the last ten years had been published their number would exceed twenty.

On the important practical point of the proportion of cases of operation that fall victims to osteomyelitis, the numbers at our command, thanks to the frank and trustworthy statistics of several of our leaders, are fuller and more informing. Killian's most recent statistics, for instance, amount to 109 radical frontal sinus operations with three deaths, one or two of which were from osteomyelitis. In all, according to the article in Katz, Preysing and Blumenfeld's book, up to a recent date, 375 Killian operations had been recorded with ten deaths—a ratio equal, on the whole, to about 3 per cent.

We come now to discuss what factor it is in the operation that leads to spreading osteomyelitis.

To this question, in spite of much debate and a little investigation, no definite reply has, so far, been forthcoming. What the operative error may be we really do not know. Post-operative osteomyelitis comes like a bolt from the blue—unexpected, inexplicable.

The simple and obvious supposition that the osteomyelitis is due to the bungling technique of an inexperienced operator is disposed

of by the fact that the disease, as we have just seen, attends upon the skilful no less than upon the tyro. At the same time, as osteomyelitis is a septic disease we may suppose that injudicious bruising of the bone edges by the forceps, prolonged exposure at the operation, careless aseptic technique, and, above all, perhaps, inadequate drainage of the wound area, will predispose to its occurrence. As we shall see in a later section, over-zealous curetting of the walls of the sinus is likewise viewed with a suspicious eye in several quarters.

Unfortunately for prophylaxis, the admission that a weak operative technique will predispose to the disease can only be made on general grounds of probability. We cannot point to the actual error that inevitably leads to the disease. In this respect post-operative osteomyelitis stands in marked contrast to post-operative meningitis, in which injury to the cribriform plate, etc., so clearly and unmistakably betrays the faulty manipulation.

The conclusion is irresistible. What seems to be an irreproachable operation may be followed by progressive osteomyelitis.

(This aspect of our subject is developed more fully in the section on prophylaxis.)

With regard to the exciting cause in spontaneous osteomyelitis we are even more in the dark. Save that the disease is more common in acute than in chronic sinusitis we know very little about its ætiology.

We now proceed to consider the supposition that the indispensable cause of diffuse osteomyelitis lies in some inherent or acquired defect in the patient's resistance to the action of the micro-organisms which evoke the pathological process; or, to state the proposition in another form, in a relatively excessive virulence of the causal micro-organism.

In some way unknown, acute infection in the case of spontaneous osteomyelitis, and traumatism in the case of post-operative osteomyelitis, may so paralyse the defensive organisation, or so enhance the activity of the micro-organisms, that progressive osteomyelitis cannot be prevented, and once started cannot be stopped.

We shall see later on that in these cases the necrotic process is confined to the bone and that the soft tissues of the scalp participate in the disease only in a modified and subsidiary fashion, therefore we must assume that the ætiological factor must operate in the osseous tissue first and foremost. It may seem difficult to assume the existence of a lack of resistance in one type of tissue

alone. This difficulty, however, is to some extent lightened when we remember that after certain debilitating constitutional disorders, particularly in children, the occurrence of septic processes involving the destruction of connective tissue and sparing the muscular, nervous and vascular structures in the affected region is not unknown. Moreover, such ulceration and necrosis is by common consent referred to defective powers of reaction in the organism. Now we have already drawn attention to the fact that an absence of vigorous reaction is a marked feature in the pathological picture of diffuse osteomyelitis.

In the case I report in the appendix to this paper (No. 7) the patient gave the history and manifested the signs of an attack of post-operative osteomyelitis and necrosis affecting the roof of the maxillary antrum ten years previous to her final illness. It is difficult to explain this double attack, save on the assumption of some inherent defect in resisting power.

The obverse of defective defence is excessive microbial virulence. Clinically, the greater liability of acute sinusitis to induce osteomyelitis may be taken as a point in favour of hyper-active virulence as a cause of the disease.

The problem might be illuminated by an estimation of the opsonic index.

(*To be continued.*)

ELECTRO-DIAGNOSIS IN DISEASES OF THE LABYRINTH.¹

By DR. E. JUNCA,
Bordeaux.

Abridged translation by Dr. JOHN M. DARLING.

NATURE OF THE ELECTRIC REACTIONS

(1) *Auditory Reactions.*—The cochlear nerve does not react, under normal circumstances, to a galvanic current. If, however, there is a lesion in any part of the ear, a current of from 5 to 6 millampères may produce the sensation of noise—"auditory hyper-excitability." Faradic stimulation produces no effect on sensory nerves. An auditory reaction is occasionally produced, but this is probably due to stimulation of the tympanic muscles.

(2) *Equilibratory Reactions.*—A galvanic current of from 3 to 5 millampères passing through the head from one ear to the other causes an inclination of the head towards the positive pole and a

¹ *Rev. Hebdom de Laryngol., d'Otol., et de Rhinol.*, March 30, 1912

sensation of vertigo. The labyrinth in pathological conditions may become hypo-excitabile or hyper-excitabile. Hypo-excitability is shown by the fact that the inclination of the head cannot be elicited ("absolute resistance"), or only by very strong currents ("relative resistance"). Hyper-excitability takes two distinct forms—firstly, the "objective" form, where the current required to produce the reaction is markedly diminished, or the amplitude of the inclination markedly increased; and, secondly, the "subjective" form, where exaggerated vertigo, nausea, and vaso-motor phenomena are present.

TECHNIQUE.

One should have at one's disposal a faradic current (useful, but not absolutely necessary) and a galvanic current of about 35 volts, the intensity of which is capable of being varied from 0 to 30 milliampères. One requires also a milliampère-meter, a rheostat, an interrupter, and a reverser. For testing the auditory reactions, Roumaillac's auricular electrode is used, the instrument being swathed in absorbent wool before introduction into the meatus. For the equilibratory tests, one uses small oval electrodes covered with a thick layer of gauze, which is moistened before application. An ordinary electrode, with a large surface, is also necessary. The electrodes should be fixed in position on the patient's head with a rubber band. The interrupter should be so arranged that manipulation of it will not impart any motion to the patient's head, nor cause any sound audible to the patient. The equilibratory reactions should always be investigated first, as the vestibular apparatus is easily fatigued.

(1) *Equilibratory Reactions to Monopolar Stimulation.*—The patient stands with his feet together. The auricular electrodes are placed a little in front of and above the tragus of each ear. They are fastened in position with a rubber band which also covers the eyes. The positive wire is fixed to one of the auricular electrodes and the negative to a large electrode placed over the epigastrium.

(a) The closure reaction is first tested, the direction and amplitude of the head inclination being noted as well as the strength of current necessary to produce the reaction.

(b) The reaction to current of constant strength is next tried. A constant current of the same strength as was necessary to produce the closure reaction is passed and the result noted.

(c) The reaction to slowly variable current is next investigated. The current is slowly increased in strength until the patient is on the point of falling or is unable to tolerate further increase.

(d) Finally, the opening reaction is noted. On breaking the current, the patient may either return to his original position or the vertigo may be increased.

The tests having been repeated with the current reversed, the other ear is examined in the same way.

(2) *Equilibratory Reactions to Bipolar Stimulation*.—For these tests the positive and negative wires are attached one to each auricular electrode. The closure reaction alone is noted.

(3) *Auditory Reactions*.—Roumaillac's electrode is placed in the meatus and an ordinary electrode on the epigastrium. The reaction to the faradic current is first tried, the current being gradually increased in strength. If a current which produces moderate contraction of the facial muscles causes no auditory sensation, one passes on to the galvanic tests. The galvanic closure reaction with positive and negative electrode is tested in each ear. One notes in each case the strength of current necessary to produce the reaction.

CLINICAL VALUE.

(A) *Auditory Reactions*.—The electrical results coincide with those obtained by acoustrie examination. Absence of electric excitability associated with complete loss of hearing is a certain sign of nerve degeneration and indicates a very grave prognosis.

(B) *Equilibratory Reactions*.—Absolute resistance indicates with certainty functional death of the centre of equilibration. Well-marked relative resistance is a serious symptom. Variations in the side to which the head is inclined seem to have little diagnostic significance.

Electro-diagnostic methods must always be combined with the ordinary clinical methods of examination.

DIAGNOSIS, PROGNOSIS AND TREATMENT OF CERVICAL ABSCESSSES OF AURAL ORIGIN.¹

BY DEODATO DE CARLI.

*Translated through the French by J. D. LITHGOW, M.B., C.M.,
F.R.C.S.E.*

Diagnosis.—Special difficulties arise where the cervical complication follows some time after the ear symptoms have disappeared, when the connection between the two conditions is hardly apparent. Superficial adenitis is characterised by a small painful tumour of rapid formation. When the peri-glandular tissue is involved the general condition and temperature serve to distinguish this from a subacute lympho-adenitis, where the fever is moderate and the general condition good. Purulent thrombosis of the jugular reveals itself by subcutaneous pain, increased by pressure along the line of the great vessels of the neck, and on palpation the vein is felt as a hard cord. General pyæmic condition and aural symptoms may mask the condition of the vein. A peri-vascular abscess gives on palpation a resistance along the anterior border of the sterno-mastoid, which may in time show fluctuation, there being at first little alteration in the skin over the surface, but later, as the pus forms, the usual signs show themselves. A certain diagnosis is arrived at when, on gently pressing the neck, pus is squeezed out from the ear or some mastoid fistula. The general state is always grave in this complication and is another diagnostic sign of value. Lateral superficial abscesses of the neck are easily diagnosed, being determined by sub-periosteal collection or by a mastoid fistula; they show themselves as circumscribed swellings with the usual classical symptoms, *rubor, tumor, cum calore*, and above all by fluctuation, there being only slight fever. Deep cervical abscesses present great difficulties of diagnosis in differentiating between the various forms. Hitherto the term "Bezold's mastoiditis" has included all these varieties. Its diagnostic characteristics are the raising of the superior insertion of the sterno-mastoid in the course of a mastoid complication of otitis, the slow formation of the swelling, its tendency to spread downward and backwards, and the limitations of the movement of the head. The general condition may vary, however. A certain diagnostic sign is the issue of pus from the external auditory meatus on pressure over the swelling.

¹ Report of the Thirteenth Congress of the Italian Society of Laryngology, Otology and Rhinology.

The collection is too deep for fluctuation to be perceived. Any confusion between this condition and maxillary adenitis accompanying infections of the external auditory meatus will be cleared up by an otoscopic examination. Retro-pharyngeal and lateral pharyngeal abscesses of otic origin show tumefaction in these regions of the pharynx and redness of the mucosa. Dyspnoea and dysphagia are prominent symptoms, while palpation and exploratory puncture are important signs. Exact connection between such an abscess can only be distinguished by the issue of pus from the external auditory canal on pressure over the tumefaction in the pharynx. Masini's symptom, which consists of lancinating pains which radiate from the ear along the pharyngeal wall towards the larynx, provoking painful spasms of cough, is also an indication of this condition. There is always fever and the general state is low. Inter-vertebro-digastric abscesses of Goris differ from the other varieties by the localisation of pain in two determined points; the first where the great occipital crosses the complexus and the trapezius, the second to the top of the head, which has a tendency to become fixed with the face turned upwards towards the diseased site. Trismus, dysphagia and neuralgic pains of the inferior maxillary also accompany this condition, while fever and general depression are marked. Superficial abscesses of the neck are easily diagnosed by objective manifestation of subcutaneous suppuration, or they cause stiffness of the neck. The elements for the diagnosis of cervical abscesses of aural origin may be either presumptive or certain. The former are co-existing ear affections, the frequency of the cervical involvements in certain determined lesions of the ear (suppuration of the cells in the point of the mastoid, suppurative conditions around and in the lateral sinus). Certain signs are the issue of pus from the ear coming from the swelling in the neck, the backward and downward spread of a subperiosteal abscess of mastoid origin, the swelling of the insertion of the sterno-mastoid (Bezold).

Prognosis.—The prognosis should be reserved, even for the superficial abscesses, and particularly so when the deeper variety is present. Thrombosis of the lateral sinus and peri-sinus abscesses call for a grave prognosis, especially where the patient's general condition is low owing to co-existing disease (nephritis, diabetes, and tubercle), or when there is a general pyæmia. Left to themselves these cervical abscesses tend to spread towards the mediastinum, following at first the natural ways, secondly the course of the aponeurosis, lastly breaking these barriers, sometimes even

when superficial, and possibly spreading more deeply. They may also spread along the line of the lymphatics, and may even end in the axilla or the back. Lateral retropharyngeal abscesses untreated may cause fatal results by producing œdema of the larynx, or spontaneously rupturing into the respiratory passages in the upper orifice of the larynx, and thus provoking a septic pneumonia.

Treatment.—One cannot separate treatment of the abscesses from that of the ear, which is the cause of the condition. In most cases the neck should be treated after the external wall of the mastoid has been removed, or the radical operation performed. In many cases, such as adenitis and lateral and retropharyngeal abscesses, the mastoid itself sometimes not being infective, the tympanum being the source of the condition, one can treat these complications without attacking the mastoid process. At the start these abscesses may be aborted by simple rest, with hot compresses, and with antiseptics of the source of infection. Lympho-adenitis can sometimes be arrested by a parenchymatous injection of 3 per cent. carbolic acid, but if it goes on to suppuration it is essential to open the abscess before, or without, operation on the mastoid. In adeno-phlegmon early and free incisions are necessary, and if gangrene be present, cauterisation may be resorted to. In suppurative conditions of the lateral sinus, or jugular, the vessels should first be opened, having previously in chronic cases performed the radical operation. The sinus being exposed, a large peri-sinus collection may be seen, and the existence of a central thrombosis being determined one then passes on to the operation in the neck. Where there is a peri-vascular abscess it is sufficient for the purpose of drainage to make an incision along the anterior border of the sterno-mastoid. Should, however, there be septic thrombosis, the vein should be ligatured below the thrombus. To reach the jugular one makes an incision in a line running from the angle of the lower jaw parallel with the anterior border of the sterno-mastoid in the direction of the clavicle; the incision should be about 3 inches long. The patient's shoulders are raised, the neck extended, and the face turned to the opposite side. One incises successively the skin, superficial fascia, and determines the anterior edge of the sterno-mastoid when the blunt dissector may be used. The vascular bundle is now seen and recognised by the pulsation of the carotid. The vascular packet is then opened, and behind and opposite the artery is found the vein which is isolated, and a doubled thread is passed for the purpose of ligaturing the vessels

centrally, or, if necessary, also towards the distal end. One then cuts the vein, and allows the pus to escape, or removes any septic thrombosis. The sinuss may then be attacked. Following this the jugular may then be washed through, after having tied the linguo-facial vein. The wound is allowed to close by second intention. Sometimes, in spite of this treatment, septic phenomena continue in the neighbourhood of the bulb of the jugular, which must be attacked directly. This is done in the following order: The radical operation followed by ligature of the jugular and exposure of the sinuss to the bulb. The mastoid incision is joined to that of the neck, when the posterior belly of the digastric is detached and after careful hæmostasis, proceeding at last to the opening at the external extremity of the transverse process of the atlas. With this point as a guide, one feels with the finger the posterior border of the jugular foramen. The soft tissues are then detached, the vertebral artery being avoided by not going too far back in the neck. With bone forceps the bulb of the jugular is freely exposed without having approached nearer than half an inch to the facial nerve. The bulb being exposed one isolates the vein in the neck to the point previously ligatured, taking care not to wound the hypoglossal nerve. The last stage of the operation consists in incision of the vein and ligature of the sinuss; one can remove the diseased vessel if necessary. Panse recommends the preparatory opening of the Fallopian canal and the temporary retraction of the facial nerve.

Superficial cervical abscesses may be opened by simple skin incision. If these are not too deep it suffices to prolong the mastoid incision somewhat downwards. Deep sub-mastoid cervical abscesses require the removal of the tip, when one can usually see the fistula through which the pus reaches the neck. The depth of the abscess cavity being carefully determined by probing, the mastoid incision may be prolonged downwards, but, should the depth be found too great to make this advisable, a separate counter-opening along the anterior border of the sterno-mastoid is called for. If the incisions have been efficient the case rapidly improves.

Lateral pharyngeal abscesses may be caused by the spread of abscesses from the neck or may extend from the tympanum by way of the tube. In the first case it is necessary to avoid opening of the abscesses by the natural route to avoid recurrences, and in the second place in this variety of abscess the vascular packet is pressed towards the interior. The external route with the two methods pre- and retro-mastoid remains, then, the precise indica-

tion. The first consists in an incision along the lateral border of the muscle down to the aponeurosis followed by blunt dissection past the great vessels when the infiltrated or purulent peripharyngeal cellular tissue is reached. The wound is dressed and allowed to heal by second intention.

The retro-mastoid route is easier. One makes a cutaneous incision about two inches along the posterior border two fingers' breadth below the tip of the mastoid process, incising the aponeurosis and retracting outwards the muscles and great vessels, and then proceeding similarly as before. If the lateral pharyngeal abscess is of tubular origin drainage by the natural route will be found sufficient. An exploratory puncture may be made of the cavity and then a free incision of the mucosa from above downwards. This same technique serves for the treatment of intervertebro-digastric abscesses of Goris. Retro-pharyngeal abscesses may be opened through the mouth without anæsthesia, the patient, usually a child, sitting on the knees of the nurse as if for adenotomy in the upright position. A mouth gag and a tongue depressor being employed, a free incision about half an inch in length is made over the prominent part of the swelling from below upwards. The instant the incision is made the patient's head is bent forwards to avoid the inhalation of the pus which pours out. These abscesses, being of lymphatic origin, do not require the external incision. A sub-occipital abscess can be opened by an incision through the thickness of the neck down to the bone. Abscesses of the neck should be treated according to the general surgical principle of effecting the most easy drainage.

SOCIETIES' PROCEEDINGS.

BRITISH MEDICAL ASSOCIATION.

Meeting at Liverpool, 1912.

SECTION OF LARYNGOLOGY AND RHINOLOGY.

JOHN MIDDLEMASS HUNT, M.B., *President.*

Abstract Report by MR. HAROLD KISCH.

(Continued from vol. xxvii, p. 672.)

Notes on Some Cases of Painful Fissure of the Mouth of the Œsophagus.—**Adolph Bronner, M.D.** (Bradford).—It was Killian who in 1908 first carefully studied the upper part from an anatomical point of view.

He proved that the lower fibres (fundiform plexus) of the cricoid pharyngeal (lower constrictor) muscle form a ring round the posterior and upper part of the œsophagus, which he calls "the lip of the mouth." He proved and demonstrated that this mouth is, in a way, similar to the cardiac orifice, that it can be opened or closed, and is generally in a state of tonic contraction. This is the spot where, on passing a bougie, we often find a resistance, more or less marked, where foreign bodies frequently lodge, where we find the opening of the œsophageal pouch; it is often the seat of cancer, and is naturally the spot where we should expect a traumatic lesion, from the passing of hard or irritating food. There is no doubt that we can get spasm (reflex or direct) of the mouth of the œsophagus, just as we get spasm of the cardiac orifice, generally of a more or less painful nature. We have all of us frequently seen cases of painful spasm of this region, which was probably due to a local ulcer or fissure, and which have lasted for months, even years, and have been permanently cured by the use of olive-shaped bougies. Often there was blood on the bougie, and we then suspected cancer or a syphilitic or tuberculous lesion.

I had noticed that the majority of these cases which came under my notice were women of thirty to fifty years of age, and that they often also had dry catarrh of the pharynx. I have only been able to follow up two cases, which had been carefully and frequently examined with the œsophagoscope. Some patients refuse to be so examined, or at least more than once. Some are most difficult to examine.

CASE 1.—Mrs. P—, aged thirty, saw me in August, 1911. Difficulty in swallowing for three or four years. There is not always much pain, but it is sometimes very severe. She has a dry feeling in the throat and nose, and has been hoarse for two or three months at a time. There was slight dry catarrh of the nose, pharynx, and larynx, with a few crusts. On examination with the œsophagoscope, I could distinctly see a small ulcer (fissure), partly covered with granulations. Ten per cent. argent. nit. was applied. In November I saw the patient again. She had been able to swallow very much better, but sometimes solids would not pass. I again examined her, and found that the ulcer was distinctly smaller, and the bougie could be passed with greater ease. On December 24th the ulcer was only just visible. She can now swallow fairly well. She complains of the accumulation of wind "below the windpipe"—a common symptom, which is evidently due to spasm of the mouth of the œsophagus. I saw her again on July 22nd, 1912. She is perfectly well and can swallow anything.

CASE 2.—Mrs. H—, aged fifty-five. She had not been able to swallow well for three years. Often had much pain, which varied. A small ulcer was seen at the mouth of the œsophagus. Bougies were passed six times, and the dysphagia disappeared. On April 1, 1909, the œsophagoscope was passed; there was no fissure visible. The patient can now swallow perfectly well. She called again, February, 1912. Has had dysphagia for two or three months. A small ulcer was again visible. Bougies were passed three times. There was slight atrophic catarrh of the pharynx. March 1, no fissure whatever.

In my opinion these have been cases of fissure of the mouth of the œsophagus similar to those recorded cases of fissure of the cardiac orifice. Possibly the dry catarrh of the hypopharynx may have been a predisposing cause, or possibly there may have been a small foreign body embedded in the mouth of the œsophagus. (Several other cases were narrated.)

Personally I think that non-malignant ulcers and fissures of the

mouth of the œsophagus are not uncommon, and that they are possibly in some way connected with dry catarrh of the pharynx.

Syphilis as a Cause of Œsophageal Stenosis.—Walker Downie, M.B., F.R.F.P.S.Glas.—As a cause of stenosis of the gullet syphilis appears to be systematically ignored. In my experience syphilis is rarely considered as a probable cause during the investigation of cases of œsophageal trouble, and many practitioners, I find, believe that the gullet is never the seat of a syphilitic lesion.

Dr. John McCrae, in Osler's "System of Medicine," says that "many authors deny that syphilis of the œsophagus occurs; this can scarcely be true, but the condition is certainly very rare. The cases described," he says, "rest mainly upon therapeutic evidence, namely, that after anti-syphilitic treatment the apparent stenosis of the œsophagus had disappeared."

In my opinion there is no doubt about syphilis being the cause of stenosis of the gullet in a fair proportion of cases: and, further, I think that that structure is affected by syphilis much more frequently than is generally supposed. I have long held this opinion, and have had the opportunity of demonstrating cases of this nature on several occasions.

Recently I published a paper under the title of "Remarks based on the Analysis of 100 Consecutive Cases of Stricture of the Gullet." In that series 11 cases were due to a lesion caused by syphilis. Syphilis of the gullet is chiefly met with in women. Of the 11 cases which occurred amongst the 100 cases just referred to 9 were in women, and as there were 63 women in the 100 cases, we have syphilis as the determining cause of the stenosis in a fraction over 14 per cent. A married woman who has had the misfortune to be syphilised by her husband has neither knowledge nor suspicion of the nature of the illness, and too often she considers it to be a concomitant part of the married state. For these reasons she does not seek treatment until her system is deeply saturated with the disease, and her health has become seriously impaired. The absence of appropriate treatment in the early stages I believe to be one of the chief reasons explanatory of the fact that cases of syphilitic stenosis of the gullet occur so much more frequently in women than in men.

The patient with syphilitic œsophageal stricture frequently has fissures at the angles of the mouth, which she will probably tell you have been there for months or years, and these fissures are usually accompanied by a chronic superficial glossitis, with recurring attacks of sore mouth, indicative of increased activity at intervals in the inflammatory process as it affects the tongue.

In these cases there is the further story of difficulty in swallowing, sometimes painful, though usually devoid of pain, and this difficulty is accompanied by a slow, but steadily progressive, emaciation, and later by considerable physical exhaustion. In my experience scars in the fauces and pharynx, and other structural losses in the palate, fauces, pharynx, or in the nose, caused by syphilis, are but rarely met with in cases where stenosis of the gullet is present. The diagnosis may be further confirmed in some instances by employing Wassermann's method of testing the blood for syphilis.

Direct examination by means of the œsophagoscope, while it enables one to make a careful inspection of the infected area and to obtain information regarding the condition of the mucous membrane in the neighbourhood of the stricture, is not of any great service in the

differentiation between the stricture resulting from syphilis and a fibrous or cicatricial stricture from any other cause.

In the early stage we may have, as Dr. Kahler has said, a deep lividity of a limited area, and there may be a yellowish coloration of the mouth surrounding the dull red area.

As illustrative of syphilis as a cause of serious stricture of the gullet, particulars of one case were related in detail.

The lady, aged thirty-three, complained of difficulty in swallowing. This she had suffered from for between four and five years, during which time she had never been free from pain during the act of swallowing, and she had difficulty in the taking of fluids as well as of solids. She had been married for nine years, and her first pregnancy had terminated in a miscarriage.

She was anæmic in appearance, with a tinge of yellow in the skin, and she weighed 7 st. 2 lb. only when fully dressed. She had fissures at the angles of her mouth, with a glazed and tender tongue, indicating a superficial glossitis.

On examining the gullet with a bougie a stricture was discovered at a distance of $7\frac{1}{2}$ inches from the upper gum, through which, with gentle pressure, a No. 7 bougie was passed. Treatment was prescribed, under which she improved satisfactorily. A later attack followed in three years.

She was then placed in a nursing home, where the treatment consisted of vigorous inunction with mercurial ointment, the administration of potassium iodide, combined with pepsin, regular and progressive dilatation of the stricture by the passage of bougies, and feeding by stomach-tube and otherwise.

At the end of three months she gained 1 st. 12 lb. in weight, and in general appearance she was marvellously improved. And now, after a lapse of close on three years, she is exceedingly comfortable and in good health.

Dr. WILLIAM HILL (London) was not convinced that Dr. Downie's claim of having observed 11 cases of syphilitic contractions of the gullet out of a total of 102 patients diagnosed as œsophageal stricture could be accepted as a conclusive record. Most of the cases came under observation many years ago, when Dr. Downie, in common with others in this country, had not realised the practicability of Mikulicz's method of œsophagoscopy. In over 180 cases of gullet disease, excluding foreign bodies, examined by endoscopy and radioscopy, he (Dr. Hill) had only observed one undoubted case of syphilis—a gumma on the deep pharynx involving the mouth of the gullet. Guisez had only seen one syphilitic stricture in over 800 gullet cases, and unequivocal records of such instances, verified either *post mortem* or by modern methods, were extremely scanty. He hoped Dr. Downie would see his way to demonstrate the condition with the œsophagoscope in one or two patients before one of the laryngological societies at an early date. It would be interesting to know in how many of these alleged syphilitic strictures the lesion was behind the cricoid plate, and therefore not, strictly speaking, œsophageal.

Discussion on the Treatment of Chronic Suppurative Ethmoiditis.

OPENING PAPERS.

I.—Prof. L. Hajek (Vienna).—For the purpose of classification we may put down the following groups of chronic suppurative ethmoiditis.

I. Chronic suppurative inflammation, with marked hyperplasia of the tissue.

II. Chronic suppurative inflammation of the ethmoid, with hyperplasia only in restricted areas, but with extensive atrophy (ozæna—Uffenorde, (1) Hajek (2)).

III. Secondary suppurative processes of the ethmoid consequent upon constitutional disease (syphilis, tuberculosis, and malign neoplasms).

I.

The cases belonging to Group I show either (*a*) that the hyperplasia predominates in the clinical picture, whilst the suppuration is circumscribed, often even latent and restricted to a few cells; or (*b*) that the suppuration predominates in the clinical picture. (*a*) These cases are represented by chronic polypus formation of the ethmoid; the treatment is therefore coincident with the problem of treatment of chronic polyposis.

There are undoubtedly cases of circumscribed polypus-formation which do not return after removal even without resection of the osseous basis; this is the best proof that polypi originate from the superficial inflamed mucous membrane. We see very often after endo-nasal operations, that the mucous membrane produces "acute" polypi. These disappear after the irritation has subsided. Polypi forming around a foreign body do not return, as a rule, if they are removed together with the foreign body. All these facts are instances of superficial inflammation of the mucous membrane of the ethmoid region.

In the majority of cases with nasal polypi we see recurrences after a while, and the therapeutic methods depend upon the causes in the reappearance of polypi.

According to my experience, as recorded (Hajek (3)), recurrence of polypi may have one of the following possible causes:

(*a*) In the course of operation not all polypi are removed, and the individual polypi are not removed together with their base (Zuckerkanal (4)).

(*b*) In many cases the empyema, which gives the inflammatory basis for the formation of polypi, is overlooked (Grünwald (5)).

(*c*) The bone, or the medulla, which with the polypi are intimately connected, is also diseased (Woakes (6)), and new polypi come out of the cellular infiltrate of the medullary spaces.

(*d*) Continual polyposis of the nasal cavity can be produced by recurrences arising from the maxillary sinus (Hajek (7)).

It is clear that we cannot remove *in toto* with our usual methods all the polypi which originate from the depths of the middle nasal canal, from the hiatus, the infundibulum, or the depths of the upper nasal canal (Zuckerkanal). We only amputate them at various distances from their base. Very often a considerable portion of diseased mucosa remains, producing new polypi. But we see daily that recurrences stop if we resect the middle turbinate, and thus can approach the base of the polypi and remove them *in toto*.

Since Grünwald (5) has pointed out that an empyema of an accessory sinus is often the primary cause of polypi, we can observe that in many cases recurrences of polypi can be prevented by proper drainage or cure of empyema. I cannot accept Grünwald's opinion that the majority of polypi are caused by suppuration of accessory sinuses. The third

reason for continual recurrence is the diseased condition of the bone itself, which is present in inveterate cases of polyposis.

As regards the nature of this disease of the bones, there are two opinions opposed to each other as regards this problem. The one was formulated some time ago by Woakes (6), who expressed his belief in the primary disease of the ethmoid bones. Zuckerkandl (8) and myself (Hajek (9)) do not agree with it, whilst the English surgeons—at least, as far as I can judge from the *Transactions* of the London Laryngological Society—still adhere to this opinion (Lambert Lack (10)), whilst other authors (Spencer (11), H. Tilley (12), StClair Thomson (13)) doubt the primary disease of the bones. Investigations by Zuckerkandl and myself, afterwards corroborated in the main points by Cordes (15) and Uffenorde (1), have shown that the inflammation starts in the most superficial strata of the mucosa, that it goes deeper and deeper in older cases. Later on it affects periosteum, and causes partly the formation of new bone (osteophytes) in the periosteum, partly rarefying osteitis. My investigations, furthermore, have shown that the inflammation, spreading into the depths, also extends into the medullary spaces of the ethmoid bone, which is markedly spongy, and fills them with cellular infiltration. The changes in the bone and the medullary spaces are therefore secondary, not primary. The main consequence of these changes is the indubitable fact that in inveterate polypus formation concomitant disease of the bone is the rule. There are present either periostitic irritations or inflammatory infiltration of the medullary spaces, which favour the return of polypi. It is therefore only logical to remove in such cases the soft tissues together with their bony basis.

The mucous covering of the ethmoid bone extends without interruption into the interior of this bone, and in *well-marked* polypi formation, the interior covering participates just like the nasal mucosa in the production of polypi (myxomatosis interna—Bosworth). Even if the osseous base is not yet diseased, we must remove in such a case the osseous fundament of the ethmoid labyrinth, for it is not possible otherwise to remove thoroughly the polypi from the interior of the ethmoid cells.

I have observed (7) and published a unique case in which continually relapsing polypi originated in the maxillary sinus, whence they came into the nasal cavity through the ost. maxillare. The case was cured by opening widely the maxillary sinus and removing the mucosa of this sinus radically.

In the majority of cases endo-nasal operation with cocaine anæsthesia is the rule. Exceptions will be mentioned hereafter.

The bulk of the polypus is removed by means of a snare or forceps with a good grip. Polypi should be "evulsed" by the snare, for evulsion is much more effective than cutting with the snare. Polypi with a broad base are best removed by evulsion with Luc's forceps.

A latent empyema of the ethmoid often becomes manifest through evulsion; for if the polypus, which blocks the openings of the ethmoid cells, is removed together with its attachment, the cells can now drain, and the empyema, formerly closed, is now open. Such observations prove that the methods adopted against an uncomplicated simple polyposis cannot be separated from those used in cases complicated by chronic suppuration.

Some surgeons recommend galvanic cauterisation of the roots of the polypus after removal of the polypi in order to prevent a recurrence. This method cannot be endorsed—first, because it does not prevent a recurrence, and, secondly, the reaction set up by the cauterisation

can become excessive and produce dangerous complications. It is best to wait a few days after a polypus operation, until the reaction subsides, before another surgical interference takes place.

The operations are repeated until all visible polypi have been removed. All procedures for the removal of polypi are only an introduction to the treatment proper, nothing more.

Repeated examinations by means of thorough cocaineisation of the nasal canals will show whether any nests of polypi are present in the middle or upper meatus. In the case of recurring polypi one can be sure that the polypoid degeneration is not restricted to the superficial mucosa, and that an extensive removal of the site of attachment of the polypi, often together with the osseous base, is indicated.

Mostly it is necessary to remove the middle turbinal in order to gain access to the whole ethmoidal mucous lining. One is often surprised at the extensive degeneration of the mucous lining, which extends into the ethmoidal ostia and the depths of the cells of the infundibulum, and which one would not have expected before removal of the middle turbinated bone.

As regards the extent of the removal of ethmoid bone, with the exception of the lamina papyracea and the lamina cribrosa each individual case must be considered separately. Also that part of the medial ethmoidal wall above the line of attachment of the middle turbinal should escape removal as far as possible, and should not be taken away high up.

As regards the method advisable the following may be said: It is most important to cocaineise well, care being taken to have adrenalin added. As much as possible should be removed in one sitting, absolute orientation during operation being a *conditio sine qua non*. This last sentence is one of the most important leading ideas of any intra-nasal ethmoid operation. Further important conditions are: Quiet position of the patient owing to good cocaineisation; then absence of hæmorrhage which, starting early, seriously interferes with the view of the field of operation. I cannot consent to the demand that all should be removed at one sitting. Such a method, excluding all individualising treatment, is fraught with danger to the patient.

The obstacles which prevent our surgical interference based on the principles sketched may be of a twofold kind: (1) General; (2) local or individual. To the first group belong diseases which *per se* prohibit or restrict all surgical interference. A local obstacle may be given by insufficient accessibility due to a deviated septum or a spine. In that case the deviation must be corrected previously. An individual obstacle is, for instance, the liability to fits and collapse. Here the operation should be done under general anaesthesia, in spite of the increased difficulty. It is often necessary for a longer interval between the sittings, so that the reaction caused by one operation may subside before the next is done. Such treatment lasts, therefore, for weeks and months; yes, even after years slight recurrences may take place, but these are generally removed in a short time. But it is important to state that, although the treatment necessitates often many operations, and requires a good deal of patience and time both on the side of the surgeon and the patient, all cases can be cured finally.

This tedious treatment of inveterate polypi explains why a more radical method, effected in one sitting, is sought after. As far as I know the famous laryngologist, Lambert Lack (10), already ten years ago favoured such a method. But I do not believe that he has found many followers, for the following reasons: The operation is much more difficult

under general than under local anaesthesia; the patient cannot aid us in clearing the nose; the most important point—the possibility of exact orientation mentioned before—is not guaranteed, for even a profuse hemorrhage cannot stop the operation, since all must be removed in one sitting. One should strictly adhere to the principle of removing rather too little than too much, for if orientation is not perfect, one has always to face the necessity of a later operation. In general anaesthesia one has the tendency to violate this principle and remove all disease at once if possible. This I believe to be a procedure that might make the operation a very dangerous one.

(*To be continued.*)

PROCEEDINGS OF THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY.

Eighteenth Annual Meeting, May 13, 14, and 15, 1912; Philadelphia, Pa.

Report by DR. L. M. INGRAM.

May 13.

(*Continued from vol. xxi, p. 615.*)

Discussion—The Standardisation of Tone in Voice Production.

The Need of a Standard in Voice-production.—Mr. William J. Henderson (New York) (Musical Critic, *New York Sun*).—The whole foundation of the so-called "Italian method" was laid as early as 1613 A.D. The codification of its laws was completed in the course of the seventeenth century, and when the great schools of that time were sending out such famous singers as Farinelli, Caffarelli, Cuzzoni, and Faustina, everything was known about singing that is known now—except the physiological laws, of which nothing whatever had been discovered. In the early part of the eighteenth century, the empirical method of instruction was the only basis of vocal art. Its prime requisite was to allow the voice to flow freely, without nasality, and without throat constriction. This was taught by example, and by helping the pupil to acquire mental conceptions of the required tone. The pupil was taught that perfect freedom was the most important thing to be accomplished—that he must not let his throat or nose interfere. In other words, he must not shut off any of his resonance chambers, or exert any muscular effort antagonistic to a perfectly normal condition of the organs.

The empirical or suggestive method of teaching was the exclusive basis of vocal art up to the time when physicians began to publish descriptions of the tone-forming organs. While for some centuries the psychological or suggestive method of teaching was the only one in use, there has not been a time when the scientific or physiological basis has been exclusive, and it probably never will be. It must be agreed that an accurate and informing terminology is a first desideratum of knowledge. It is here that the chasm between the teacher and the physioist remains as wide as it was in the beginning. The apparent intricacy of the physiology of the organs of tone has alarmed many teachers, who, after looking up some of the simpler treatises on the

"hygiene of the voice," have gathered a few uncertain ideas which they have forthwith endeavoured to apply to practice. They have struggled vainly to reconcile their construction of the meaning of the time-honoured figurative terminology of their profession with physiological theories. Errors in teaching result. Failures in modern teaching, and confusion in vocal terminology are largely due to want of organic union between the psychology and physiology of voice-teaching. The desired result is to be obtained by a closer community of knowledge between teachers and throat-specialists. The new pedagogy of the vocal art would thus be founded on sound psychological and physiological principles. A general and authoritative science would be built up, which critics would have to learn in order that public attention be rightly directed.

The Result of Eighteen Years of Research Work in Voice-production and Voice-analysis.—William Hallock (Prof. Physics, Columbia University, New York, N.Y.) and Floyd Muckey, M.D. (New York, N.Y.).—Voice-production is simply the production of air-waves, and is subject to the mechanical laws which govern this. The voice is a complex tone—*i. e.* it is composed of several tones varying in pitch and intensity. These are called the partial tones, or the fundamental and overtones. In the analysis of the voice the Helmholtz spherical resonators and a modified form of the Koenig manometric capsule were employed, together with a method devised by the authors, of photographing the motion of the manometric flames.

Experiments were made to determine: (1) What determines the length of the wave or the pitch of the tone; (2) the height of the wave or the intensity and carrying power of the tone; (3) the quality of the tone or the number and relative intensity of partial tones. An exhaustive examination of the whole range of musical instruments reveals the fact that only the characteristics of string instruments will satisfy the conditions involved in the vocal mechanism. The pitch of the fundamental tone is determined by the length, weight and tension of the vibrating cord. The larynx is the pitch mechanism, having all the means of controlling the three factors which determine the pitch of the string—length, tension, and weight. Actual analysis shows the over-tones of the vocal cords to belong to a series of a string, and not to that of a reed, plate or membrane. The height of the wave, or the intensity and carrying power, is controlled by the extent of the swing of the cord and resonance, the latter being the more important. Increased swing of the cord is brought about by increased breath or pressure, and hence the expenditure of energy. The full use of resonance can be attained by absolute lack of effort.

The ætiology of quality is dependent upon segmentation of the vocal cords and resonance. A "pure tone" is one which is produced by one single rate of vibration, as a tuning-fork with its resonators. Over-tones must bear the same pitch relation to the fundamental, no matter what that may be. The amplitude of the waves composing the various partial tones is very small when they leave the cords, and without reinforcements would have little or no effect on the auditory apparatus. They are amplified by the air in the resonance cavities. Resonance is the most important element in voice-production, being the chief factor in both intensity and carrying power and quality. In correct voice-production there must be: (1) Absolute freedom of motion of the cartilages of the larynx; (2) perfectly free vibration of the vocal cords; (3) the fullest possible use of resonance space. Any action of throat

muscles which prevents the free use of any or all of these factors must be termed an interference.

The diagnosis (by voice auscultation) of the various interferences, their prognosis and treatment, were discussed by the authors. The natural law of voice-production is "relaxation of the extrinsic muscles." The action of the intrinsic muscles of the larynx must be made absolutely independent of the extrinsic. A singer or speaker must learn to produce a tone without interference, and then practise this tone until the whole range and volume are developed.

A standard of criticism can be developed only from voice-analysis, which trains the ear to detect interference.

Vocal Art Science from the Standpoint of the Teacher.

Mr. and Mrs. Henry Howard Brown (Colo. Springs, Colorado).—The readers of this paper expressed the belief that "standardisation" will be brought about just as soon as the laryngologists, critics and influential teachers make up their minds that the many formulas which now exist must be superseded by a system of tone production, based upon the scientific principle of cause and effect.

The "standard tone" is one in which there is full development and perfect harmony of its anatomical, physiological, psychological, and pedagogical constituents. The pedagogical and physical constituents are those which need to be standardised. The former may have a complete vocal science at its command as soon as the physical is placed upon the right footing. The physical requirements for the production of standard tone were described, as were also the relations of bad production to pathological conditions. Whether the derangements which cause bad tone production are in the vocal action itself or in the interfering muscles outside of it, they act directly upon the cords and prevent artistic production. Laryngologists find many cases that puzzle them in treating singers and speakers; they become aware of various kinds of vocal decadence without sufficient pathological conditions to warrant them, many of which seem to disappear under treatment and with rest, only to return in worse form with further voice use. Physicians would more frequently call upon voice specialists to stop these conditions if there were a reliable standard. A closer co-operation of laryngologists and singing teachers was suggested.

Vocal Art Science from the Standpoint of Use and Abuse of the Voice.

—**Dr. Frank E. Miller** (New York).—He believed that, in general, laryngo-pharyngeal observations were so replete with inaccuracies and individualisms, so far as voice-production is concerned, that conclusions of general value could be determined. Individual cases should be set aside, to give room for thousands of observations on different schools and individuals in order to furnish solid facts which could be depended upon. It was necessary that the physicians, physicists, singing teachers and performers, each one in his own sphere, and all collectively, should work in harmony for a common end and goal.

In 1891 he stated the necessity for a standard of tone, and had the idea of constructing a voice measure, a tester, phonometer or vocaneter. It was to consist of a combination of a phonograph, photograph, and a mechanical reproduction of the registration of the vocal sounds, the combination so arranged as to form a standard for vocal tones to measure and compare for all time every voice in the world. After much deliberation and discussion, one conclusion was irresistible, viz. that for the

present the only practical vocomotor is the tried and experienced *maestro*, who, by his trained organ of hearing and power of judging expression, was able to conduct the pupil to use properly the voice in a perfect manner, so that the tone sprang from the throat with spontaneity and reserve.

In regard to the loss of voice in singers, ignorance of any method of singing and a radically incorrect method are the most prolific causes of voice failure among singers.

The important question, How is tone produced by human vocal organs? has up to the present remained unanswered. This he ascribed to the fact that the various classes of specialists seldom worked together. Each one makes researches in his own line without regard to important factors found by the others.

In order to understand our subject we should have a correct voice analysis. Artistic singing involves complete physiological control of the voice-producing function, combined with entire command of the meta-physical resources of art. In order to understand what is meant by "physiological control of the voice-producing function," it is necessary for us to have a correct understanding of the voice-producing mechanism and the method of control.

It is proposed to mark the singer upon a basis of 100 counts, and to give such points as range, resonance, breath control, etc., their due value in the sum of the whole. Before presenting the scheme of marking it will not be amiss to explain clearly what is understood by range, timbre, volume, and other terms.

Resonance is the reinforcement of song by means of hollow spaces, which gives quality to vocal sounds by their reverberation. In singing we distinguish between nasal and palatal resonance. These should be balanced, and when we say the resonance is not well distributed we mean that one or the other is lacking or deficient in quantity. In speaking of nasal and palatal resonance it should be understood that there are other resonances.

By flexibility we mean plasticity or pliancy. The flexible voice can execute rapid and difficult phrases with ease, while the stiff voice finds only the slower and heavier passages possible to it. Agility comprises the power to execute trills, flourishes, and florid work generally.

We understand by breath control, breath so managed as to insure good phrasing and steady support to the tone. The abominable wavering and wobbling of tone which so often offends the ear is nearly always caused by defective breath control.

When we make a special note of the tongue we are considering its position, as it may prove to be a serious obstacle to the attachment of the open throat and the smoothly flowing tone.

The Germans call timbre "tone colour." Timbre is individuality of the voice. No two of us have identical timbre. We may speak of a voice of white timbre or quality—showing lack of nasal resonance, dark timbre—the result of a sort of false weight and the besetting sin of contraltos; sympathetic, rich timbre, and so on *ad infinitum*.

He divided singers into three classes: First class, ninety marks or over; second class, between seventy-five and ninety; third class, below seventy-five.

Now let us consider causes influencing the resonating spaces. The causes influencing the resonant spaces are the three valves of our instrument, viz. the palate, tongue and epiglottis. The action of these determine the entire voice question, because they not only govern our

resonating spaces, but control in a very elastic way the action of our whole instrument.

When the palate is removed, so as to make a perfect arch, as has been done in former years, without consideration of its effect upon the voice, we have the well-known symptom of agophony, or bleating, and ability to form overtone is markedly diminished. Yet, even with this, an artist has been known to go through his whole career, but not without extreme mental suffering through his vocal exertions. I do not mean even to suggest how this body shall decide that operation, but we should consolidate upon one opinion as to where and how it should be ablated. As within its folds and attachment we have the tonsils, another question comes forward. Normal tonsils assist the voice by separating and by moistening the adjoining muscles. In this way they modify and hold the balance of resonance of the three cavities just mentioned, and they are of most phonetic value when normal. Diseased and enlarged tonsils interfere with all the muscles in their vicinity by infecting them and distorting the vibrations of the voice and impairing the functions of the three cavities just mentioned. If they can be restored to normal by any means otherwise than by removal, it might be tried, but we must bear in mind that voice is a habit, and if the habit is bad it is better to remove the tonsils. Diseased tonsils, on the atrophic side, are more to be feared because they harbour pathologic germs, which result in infections. Among the results of these infections we have the node, which in turn will be influenced by the special poisoning that infects the tonsil, diphtheria, mixed infection, staphylococcus and streptococcus, which cause catarrhal conditions of the pillars and the plica.

Dr. H. HOLBROOK CURTIS (New York City) held that Dr. Muckey's entire theory was based on a false premise, viz. "that the vocal cords only follow the laws of the vibration of strings." Helmholtz and Tyndal have asserted that the cords act in vocal production as vibrating reeds, and Oertel has demonstrated this fact with the stroboscope by showing that the cords in vibrating exhibit nodal lines on their surface running parallel with the free border. He demonstrated experimentally that the cords do not necessarily start the pitch, but may be made to accept secondarily the pitch of the mouth-cavity. He used Holmes's pharyngoscope introduced through the slot of an instrument to show that the cords do not enter into the question of initial pitch.¹ The nasophone is constructed so that a simple breath of air expelled through the nose is conducted through a flat tube and passes over a $\frac{1}{8}$ by $\frac{1}{2}$ in. slot in the plate, covering the partially opened mouth. The air-blast is broken by the lower edge of the opening, exactly as an air-blast in an organ pipe is divided at the *embouchure*. Then the mouth, acting independently of the larynx, becomes a resonator, and we can play any tune by altering the shape of the mouth-cavity. The mouth-cavity is closed posteriorly by the approximation of the soft palate and tongue, for one cannot blow air in a constant stream through the nose with partially open mouth without this closure of the soft palate. In this way the mouth, by enlarging and diminishing, acts as a true organ-pipe, and the tone is in accord with the pitch of the cavity. He did not deny that the cords vibrate as strings, but he held that they also vibrate as reeds and are capable of accepting the pitch from the resonators, and the apparatus

¹ The use of Holmes's pharyngoscope is to demonstrate that the mouth-cavity is closed by the apposition of the tongue and soft palate during the playing, not to view the cords, which of course cannot be seen. In studying the action of the cords in producing tones a Hay's pharyngoscope must be used.

becomes of the flute, clarinet, and the mouth harmonica variety. It is impossible to demonstrate mathematically all the possibilities of the vocal mechanism. His own work has been on the lines of changing the manner of the vibration of the cords in the cure of vocal nodules. It has been proved, to the satisfaction of many of our noted singers, that the tone sung in a manner to change segmentation of the cords and to relieve a rubbing together of the opposed vibrating parts will of itself cure this trouble. If the cords only vibrated as strings this could not be done. For it is by changing the manner of vibration that this is so easily accomplished. He saw no reason to-day to alter his theory of the manner of voice-placing as described in his book published eighteen years ago.

Mr. MORGAN J. GOLDSMITH (New York City) said he had tried Dr. Curtis's method for some time, and had tried also to work out the scheme of Dr. Muckey, but Felix Pozzo, a celebrated Italian tenor, the originator of the method now advocated by Muckey, had solved the problem for him. After several years of experimentation he had proved to his own satisfaction and that of others that there must be tension in voice production. In order to make a tone vibrate properly there must be initial tension which will drive the tone out. When that is done properly and the tone is trained to vibrate in the nasal cavities it seems to relax the muscles until the nasal tone reaches an enormous height. It is possible to make tones from lower C to high B-flat. Conscious breathing is one of the greatest detriments to vocal culture. He had made tones which are loud and large, besides tones of every variation of power and colour, and Dr. Miller had tried in vain to find out how the breathing had been adjusted. It is the propulsion of the vibrations up into the nasal cavity which produces regular and pure tones.

Dr. HOLMES W. MERTON (New York) pleaded for a consistent nomenclature, upon a fundamental basis of tone-production, and on its mental and physiological laws and relations, so that a science of phonetics could be formed as near as our adverse language will admit. After this each teacher might add to these the individual and pedagogical technique of which in no other art of teaching is so much required. All must greatly admire the technical skill, prolonged efforts of specialists and physicists in constructing wonderful devices intended to fathom the facts of sound, but these instruments add artificial factors not at all present in the acts and laws of sound, singing or hearing. In the circuit of these artificial records many other factors enter and others are omitted. What we really have in tone production is a succession of explosions or strokes, generating alternating spheres of condensed and rarified air travelling away from the centre of explosion or propulsion, acting under the laws of elasticity and momentum. It is claimed that pitch is determined by the tension, weight and "rate of vibration" of the cords. Yet thousands of experiments can be made proving that much over an octave of pitch can be generated even gliding up and down without change of rate of the fundamental strokes or explosions; and this can be done by several methods, as by change of size of resonance chambers, change of apertures, change of angles of deflection, etc. Furthermore, these changes of pitch are not amplifications of harmonics and over-tones, but are the interharmonic pitches as fundamentals, and are themselves subject to over-tones. Following the theory of a vibrating string, we are told to-day, even, that over-tones of the human voice are produced by seven or eight different sets of "nodes of vibration" superimposed upon the fundamental vibration of the vocal cords. Physio-

logically it is impossible, and acoustically out of the question, to produce harmonic over-tones. A study of the structure and function of the vocal organs will prove this. The vocal cords, so-called, do not resemble either a free cord, a string, or a vibrating reed. They form double-lipped pressure valves, having the physiological action of a pair of opposing semi-valves, opening and closing their margins by bowed twists upon the axis of each half of the triangular muscle bodies of which they are chiefly composed, thus forming two triangular-lipped oblong discs bending on their respective axes. They open and close with great rapidity when tensed and when the elastic air from the lungs is urged against their under surfaces and through the narrow aperture of their approximated lips. This results in a series of explosions into the vocal chambers above, there to be modified into vocal tones and over-tones. We are compelled to reason that over-tones of the voice are due to the revolution and transversion of the air thrusts into the vocal cavities, and not to the nodal vibrations of the valves. These bi-secting revolutions and transversions create intermediate reverberances and resonances, due to the nature of the apertures and the elasticity of gases. Physiological and vital problems arose all through the study of voice culture. Too much attention had been paid to the physics of acoustics and too little to the vital organs and chambers of voice and hearing, and especially to their vital and mental co-ordinations. Physics and mechanics were necessary to artificial records of sound and of voice, or to their mechanical reproduction, but artificial factors enter into these, and when we approach the voice and hearing, these last are vital and organic and do not obey physical laws and processes such as the moving disc, cylinder and moving ribbon, the angle armature point, fibril torsions, etc., none of which are factors of air-stroke momentum, gas-stroke, or time frequency.

REPORT OF THE PROCEEDINGS OF THE MEETING OF THE CHRISTIANIA OTO-LARYNGOLOGICAL SOCIETY.

March 4, 1912.

PROF. UCHEMANN *in the Chair.*

Prof. Uchemann brought forward a girl, aged fifteen, cured of **extra-dural abscess and brain abscess**. She entered the hospital on September 29, 1911, suffering from otitis media suppurativa of eight days' duration. The same morning she had had shivering attacks and pain behind the ear, and, on arriving at the hospital in the evening, was in a state of complete stupor. Temperature 102.2° F., pulse 120. Sensitiveness and a slight swelling over mastoid process. A polyp in the auditory canal. Replied in a confused manner when addressed. Lumbar puncture gave clear fluid. Radical operation performed the same evening by exposing sinus and dura over tegmen tympani and mastoid. Sinus normal. Dura found thick, discoloured, and with a necrotic coating; no perforation. Next day temperature 100.1° F. Slept during the night. Condition otherwise about the same as on the preceding day. Once in a while she said a few confused and incomprehensible words, but did not

give the impression of being unconscious. On being shown various objects, such as a knife, key, etc., she could not say their names, but intimated at the same time that she knew them. On being asked whether she had headache, she appeared not to comprehend, but on being asked in writing she answered "No." There was therefore sensory and amnesic aphasia. Temperature the same afternoon 104.4° F. On splitting the dura there was found to be softening of the adjoining part of the brain. On examination, the feeling was conveyed of entering a cavity the size of a walnut with an inward and backward direction. A glass drain was inserted. Culture from the softened mass showed staphylococci. The following day temperature 102.8° F., but more clear. On dressing the wound, pus was seen coming out from between the bone and dura. With a probe one comes into a cavity extending forwards and upwards between dura and the bone for a length of about two inches to the foremost part of the temporal region. The bone was therefore removed of the size of half-a-crown. Stinking pus in the cavity. Dura coated with a greyish almost fatty coating. No pus in the drainage-tube into the brain abscess. On introducing forceps in the same direction as the exposed dura, there came a quantity of softened brain tissue and thin fluid. A glass drain was again inserted. October 3: The temperature and pulse were normal. Aphasia unchanged. Replied only "Yes" and "No" to questions, but looked round in an interested way and seemed to understand. Drainage-tube removed October 4. October 5: The patient clear to-day. To the question as to what a finger is called she answered, after considerable hesitation, "Finger." The word "hand" she could not utter. Subsequent progress normal. Wound closed with plastic. On leaving the hospital on February 21, whisper was heard at one metre by the left ear.

This is a case of brain abscess opened at the earliest stage, having as yet only the character of a softening. The extensive extra-dural abscess was probably much older, and, compared with the brain abscess, primary.

Uchermann then brought forward a patient in whom a **naso-pharyngeal fibroma** had been removed by way of the trans-maxillary nasal method (Denker's). This was the fifth patient treated for this complaint in the course of a year and a half. All were young men, the tumours being of medium size and issuing from the surface of the sphenoid bone, the recessus ethmo-sphenoidalis, the choanal edge and the adjoining parts, in all combined with fairly large growths in the epipharynx. In all these cases the removal was effected without any considerable or dangerous bleeding, by the help of strong, straight or bent, tumour forceps. Hæmorrhage was always quickly stopped by the help of tamponade. He therefore had not felt any great need for using the Kuhn intubation apparatus, even though this might perhaps offer certain advantages during narcosis. The great advance in the treatment is due to Jacques and others, who have proved that the tumours proceed from the said region in the upper regions of the nasal cavity, and not, as was formerly presumed, and is still maintained by surgeons, from the basilar process of the occiput, and particularly from the fibrous tissue between that and atlas. These cases testify to the correctness of the opinion of rhinologists. The tumours must not primarily be attacked from the pharynx, for here the root is not reached, but from the nose. Previous bad results, sometimes with fatal bleeding, were chiefly due to the fact that the operation was begun from the wrong side. If, on the other

hand, there is any part of the tumour left after the nasal intervention there is no objection to its being removed by way of the pharynx should it be found most convenient. It is then easy to apply a retro-nasal tampon. Smaller portions that are left may be removed with galvanic or thermo-cautery. In four cases the cure was rapid and there was no recurrence. In one case the operation had to be repeated owing to a recurrence, proceeding mainly from the sphenoidal sinus, and which long defied treatment with the galvano-cautery. He is now cured.

Uchermann produced a **foreign body**, a metal clip, which had been removed from a three-year-old girl with forceps. It lay in the introitus laryngis with the lower end wedged into the hypopharyngeal back wall. The child had fever (101° F.) on arrival, and the clip had been there for two days. There proved to be a double broncho-pneumonia, from which the patient died two days later. On a *post-mortem* there was also found an abscess the size of an almond in the pharyngeal wall, corresponding to the lower edge of the metal clip.

Fleischer demonstrated a twelve-year-old girl, admitted to the hospital on January 29, 1912. She was said to have swallowed a penny squeaker at a fair two hours before her arrival. Immediately after she had a severe attack of dyspnoea. Afterwards dyspnoea was barely noticeable. A slight stridor was heard; no retraction of the chest-wall. With the laryngoscope nothing abnormal was seen; the upper part of the trachea was seen well. Examination of the lungs showed that respiration was equal on both sides. The patient was very apprehensive, with pulse about 112, but was otherwise well. Could eat and drink without difficulty. Low tracheotomy under chloroform narcosis was at once carried out. On introducing a Piniazek's tube the mouth-piece of the squeaker was seen lying across over the bifurcature. The bladder lay in the left bronchus, while the free end of the mouth-piece stood right over the mouth of the right bronchus. We succeeded in removing the foreign body with a Patterson's forceps. It proved to be an ordinary squeaker of a total length of 6 cm. (3 cm. bladder + 3 cm. mouth-piece) and with a diameter of from 9 to 11 mm. The object had apparently lain quietly in trachea, as the bladder had adhered to the wall, and had then been inspired into the left bronchus owing to the strong coughing fits during the termination of the tracheotomy. What is worthy of attention is the discrepancy between the large object and the slight dyspnoea. The latter was so slightly pronounced when the examination was made that the history of the illness appeared highly improbable.

SEVENTEENTH INTERNATIONAL CONGRESS OF MEDICINE (LONDON, 1913).—SECTIONS OF RHINOLOGY AND LARYNGOLOGY AND OTOTOLOGY.

The following is the revised list of subjects for discussion in the above Sections, together with the openers of the debates ("reporters").

SECTION XV.—RHINOLOGY AND LARYNGOLOGY.

OFFICERS.—*President*: Sir STCLAIR THOMSON. *Vice-President*: J. B. BALL, J. W. BOND, J. DUNDAS GRANT, D. R. PATERSON, HERBERT TILLEY, A. LOGAN TURNER, P. WATSON WILLIAMS, GIDE WIDJACK.

R. H. WOODS. *Council*: H. S. BARWELL, ADOLPH BRONNER, J. W. BROWNE, H. J. DAVIS, J. WALKER DOWNIE, G. WILLIAM HILL, J. MIDDLEMASS HUNT, H. LAMBERT LACK, GREVILLE MACDONALD, JOHN MACINTYRE, C. A. PARKER, L. A. PEGLER, W. PERMEVAN, H. BETHAM ROBINSON, P. R. W. DE SANTI, SIR FELIX SEMON, E. B. WAGGETT, G. WILKINSON. *Secretaries*: DOUGLAS HARMER, A. BROWN KELLY, DAN MCKENZIE.

PROGRAMME OF MORNING. DISCUSSIONS AT 9.30 A.M.

Thursday, August 7.—“On the Recent Progress of Endoscopic Methods as Applied to the Larynx, Trachea, Bronchi, Œsophagus and Stomach.” *Reporters*: Prof. G. KILLIAN, and Prof. CHEVALIER JACKSON.

Friday, August 8.—Conjoint Meeting. (The President of the Section of Laryngology to preside.) “The Methods and Results of Treatment of Diseases of the Throat, Nose and Ear by Salvarsan and other Arsenical Compounds.” *Reporters*: Prof. P. GERBER and Dr. ANDRÉ CASTEX.

Saturday, August 9.—“Indications for, and Relative Values of, Tonsillotomy and Tonsillectomy.” *Reporters*: Prof. H. BURGER and Dr. J. L. GOODALE.

Monday, August 11.—Conjoint Meeting. (The President of the Section of Otology to preside.) “The Special Treatment of the Throat, Nose and Ear during the Active Stages of Certain Infectious Fevers, namely, Scarlet Fever, Measles, German Measles, Mumps, Influenza, Typhoid, Whooping-cough, Smallpox, Chickenpox, Erysipelas, Anterior Poliomyelitis, and Cerebro-spinal Meningitis (Diphtheria excluded).” *Reporters*: Dr. VICTOR DELSAUX and Dr. E. W. GOODALL.

Tuesday, August 12.—“The Pathology and Treatment of Malignant Growths of the Nose and Naso-pharynx (Fibroma to be excluded).” *Reporters*: Prof. G. FERRERI, Dr. H. MARSCHIK, and Dr. E. LOMBARD.

AFTERNOON SESSIONS. 3 P.M. TO 6 P.M.

These will be devoted to papers offered by members of the Section, the Staff of the section having power of selection from the papers offered. Not more than fifteen minutes will be allowed for the reading of any one paper, and not more than ten minutes for any speech in the discussion thereof.

MUSEUM.

This will include specimens, macroscopic and microscopic and other exhibits to illustrate—

(1) Neoplasms of nose, accessory sinuses and naso-pharynx (excluding mucous polypus).

(2) The rarer forms of laryngeal tumours, including post-cricoid carcinoma.

(3) Diseases of the trachea and bronchi.

There will be an exhibition of instruments to illustrate recent improvements in broncho-œsophagoscopy, and the Committee is prepared to arrange for a limited number of short demonstrations in the Museum at stated hours. Members who desire to lend material for exhibition are requested to communicate with Dr. McKenzie.

Museum Committee: J. W. BOND (*Chairman*), A. LOGAN TURNER, L. H. PEGLER (*Curator*), DAN MCKENZIE (*Secretary*), 62, Brook Street, London, W.

All specimens lent to the Museum will be insured, and every care will be taken to return them safely to exhibitors immediately after the Congress.

Acting Secretary of the Section: DOUGLAS HARMER, 45, Weymouth Street, London, W.

SECTION XVI.—OTOLOGY.

OFFICERS.—*President:* ARTHUR CHEATLE. *Vice-Presidents:* THOMAS BARR, H. S. BIRKETT, MARK HOVELL, EDWARD LAW, J. KERR LOVE, WILLIAM MILLIGAN, URBAN PRITCHARD, PERCY WEBSTER. *Council:* J. STODDART BARR, G. NIXON BIGGS, J. MCKENZIE BOOTH, H. H. B. CUNNINGHAM, J. GAY FRENCH, CECIL GRAHAM, ALBERT A. GRAY, GEORGE T. GUILD, THOMAS GUTHRIE, SOMERVILLE HASTINGS, W. JOBSON HORNE, HUGH E. JONES, RICHARD LAKE, H. J. MARRIAGE, FRANK MARSH, W. M. MOLLISON, F. O'KINEALY, W. S. SYME, HUNTER TODD, C. E. WEST, F. H. WESTMACOTT, A. L. WHITEHEAD. *Secretaries:* J. S. FRASER, G. J. JENKINS, SYDNEY SCOTT, J. B. STORY.

PROGRAMME OF MORNING. DISCUSSIONS AT 9.30 A.M.

Thursday, August 7.—“Pathology of Deaf-Mutism.” *Reporters:* Prof. ALFRED DENKER and Prof. HOLGER MYGIND.

Friday, August 8.—Conjoint Meeting. (The President of the Section of Laryngology to preside.) “The Methods and Results of Treatment of Diseases of the Throat, Nose and Ear by Salvarsan and other Arsenical Compounds.” *Reporters:* Prof. P. GERBER and Dr. ANDRÉ CASTEX.

Saturday, August 9.—“Non-suppurative Diseases of the Labyrinth.” *Reporters:* Prof. GUSTAV ALEXANDER and Prof. KARL VON EICKEN.

Monday, August 11.—Conjoint Meeting. (The President of the Section of Otology to preside.) “The Special Treatment of the Throat, Nose and Ear during the Active Stages of Certain Infectious Fevers, namely, Scarlet Fever, Measles, German Measles, Mumps, Influenza, Typhoid, Whooping-cough, Smallpox, Chickenpox, Erysipelas, Anterior Poliomyelitis and Cerebro-spinal meningitis (Diphtheria excluded).” *Reporters:* Dr. VICTOR DELSAUX and Dr. E. W. GOODALL.

Tuesday, August 12.—“Climatic and Occupational Influences in Diseases of the Ear.” *Reporters:* Dr. CLARENCE J. BLAKE and Prof. GIUSEPPE GRADENIGO.

AFTERNOON SESSIONS, 3 P.M. TO 6 P.M.

These will be devoted to papers offered by members of the Sections, the staff of the Section having power of selection from the papers offered. Not more than fifteen minutes will be allowed for the reading of any one paper, and not more than ten minutes for any speech in the discussion thereof.

MUSEUM.

This will include specimens, transparencies and other exhibits to illustrate the Anatomy, Physiology, Pathology and Surgery of the Labyrinth. Members who desire to lend material for exhibition are requested to communicate with Mr. Mollison.

Museum Committee: C. E. WEST (*Chairman*), A. A. GRAY, H. J. MARRIAGE, W. M. MOLLISON (*Secretary*), 48, Brook Street, Grosvenor Square, London, W.

All specimens lent to the Museum will be insured, and every care will be taken to return them safely to exhibitors immediately after the Congress.

Acting Secretary of the Section: SYDNEY SCOTT, 130, Harley Street, London, W.

Abstracts.

LARYNX.

Schmiegelow, E. (Copenhagen).—On the Treatment of Chronic Laryngeal Stenosis by Means of Drainage Tubing. "Monats. f. Ohrenheilk.," Year 46, No. 5.

This article alludes to methods elaborated by the author during the last few years. They were first described by him at the Scandinavian Oto-Laryngological Congress in Copenhagen (August 26, 1911), and an account published in the *Archiv. f. Laryng.*, Bd. xxv, H. 3.

The procedure, which the writer states is exceedingly easy to perform and most tolerable by the patient, consists in laying open the trachea and larynx under general anæsthesia, removal of the cicatricial tissue, introducing a piece of rubber tubing, which is maintained in position by a piece of silver wire transfixing the thyroid alæ, and finally closing the wound over all. This is worn without discomfort for some three months, when it is removed *viâ* the mouth after withdrawal of the silver wire. Two cuts illustrate the operation. As regards details in the technique, a piece of silk should be threaded through the tube before laying it in position, so that any danger of its slipping down into the trachea may be avoided before its final fixation with silver wire; the silk is withdrawn when the wound is closed. The upper end of the tube should not lie above the aditus or lower than the cords, otherwise food may be inspired in the first case and dyspnoea occur in the latter. The free ends of the silver wire are conveniently clamped in a small lead bullet.

The following two cases are quoted as examples:

(1) *Post-tracheotomy Stenosis of the Trachea in a Girl, aged five*, who three and a half years before had had tracheotomy performed for croup, and since then had worn a tube. Direct tracheoscopy showed a cicatricial diaphragm immediately above the wound, with a small slit-like opening. On September 16, 1911, the operation as above described was carried out. Three days later it became necessary to alter the position of the tube on account of dyspnoea. The upper end did not reach above the cords, and was occluded by granulations. Convalescence proceeded without interruption, and on November 4, 1911, under direct vision the tube was withdrawn. The tube was thus in position forty-four days, and with the exception of some slight difficulty in swallowing liquids at first did not cause any discomfort. On inspection in April, 1912, the voice was good, and the appearance of the larynx quite healthy.

(2) *Stenosis of Larynx in a Woman, aged fifty-five*. Thyrotomy and removal of the right vocal cord on account of epithelioma October 17, 1911. Uneventful convalescence and discharge from hospital, to which, however, she returned on December 15, 1911, with dyspnoea. The region of the larynx was swollen and tender. Pressure on the thyroid cartilage caused discharge of pus from a sinus in the wound. The

interior was so swollen and injected that only a small air-way existed posteriorly. Tracheotomy was performed the next day, and on December 28 the larynx was again opened in order to remove both cartilaginous alæ, which appeared necrotic. No evidence of recurrence was to be seen. With a view to avoiding stenosis a rubber tube, 4 cm. long, was fixed in the larynx by means of a silver wire passed through the soft tissues. As so large a suppurating cavity was left after removal of the cartilage, the wound was merely brought together with two stitches and dressed with iodoform gauze. Since the patient could not swallow fluids without coughing, although on inspection the end of the tube did not appear too high, a nasal tube was passed and retained in the œsophagus for eighteen days. However, as this disability then still persisted, the tube was drawn out of the thyrotomy wound and shortened 1 cm., after which she was able to swallow easily and put on weight. On February 17, 1912, after division of the silver wire, the rubber tube was taken out, and as there was then a good laryngeal passage the tracheotomy tube was also removed. The patient was discharged on March 7 with natural use of the larynx.

Alex. R. Tweedie.

NOSE.

Forbes, Duncan, and Newsholme, H. P.—**Membranous Rhinitis.** "Lancet," February 3, 1912, p. 292.

A paper written to illustrate the relation between membranous rhinitis and diphtheria, and to describe the treatment of three cases by a vaccine. The authors conclude that (1) membranous rhinitis can readily produce similar disease in others; (2) the connection between membranous rhinitis and diphtheria in a school outbreak described was so intimate as to make a causal relation between them almost certain; (3) it is a point of great practical importance that the comparatively frequent occurrence and great infectivity of membranous rhinitis should be recognised widely—missed cases of the disease would readily account for a not inconsiderable proportion of school diphtheria; (4) an autogenous vaccine seems to be of definite value in removing membrane, getting rid of nasal discharge, and hence greatly reducing the infectivity of membranous rhinitis; but the vaccine does not appear capable of completing the work of elimination after the membrane has gone.

Macleod Yearsley.

Caldera and Gaggia (Turin).—**The Sero-diagnosis of Ozæna.** "Archiv. für Laryngol.," vol. xxvi, Part I.

The results of the Wassermann reaction carried out both by Sobernheim and by Alexander in a number of cases of atrophic rhinitis, lent no support to the view that this disease should be regarded as one of the para-syphilitic affections. Assuming, however, that ozæna is an infective disease due to some specific micro-organism, one might reasonably expect that its presence would be demonstrable by a complement fixation test. If, therefore, such a test were to be found positive in a sufficient number of cases, conclusions might be drawn as the ætiology of the disease. The authors studied in this way ten well-marked cases, but in none of them did complement fixation take place. It is true that in certain undoubtedly infective diseases complement fixation does not occur, yet the authors consider that the negative results which they obtained render it highly improbable that the disease is due to any specific micro-organism.

Thomas Guthrie.

Sobetky, Irving.—Infiltration Anæsthesia in the Submucous Resection of the Nasal Septum. "Boston Med. and Surg. Journ.," February 1, 1912.

The author advocates the application of a 2-4 per cent. solution of cocaine to the septum, followed by the injection of 10 c.cm. of sterile normal saline with 4 minims of 1:1000 adrenalin. The injections are made (1) just posterior to the junction of the skin and mucous membrane on the septum, (2) at the junction of the septum and nasal floor, (3) opposite the anterior end of the middle turbinate, (4) septum opposite beginning of superior meatus. About 1 c.cm. is injected at each spot, and the needle must be introduced *through* the perichondrium. The case is ready for incision in five minutes. *Macleod Yearsley.*

Ritter, G., (Berlin).—The Separation of the Mucous Membrane in the Submucous Resection of the Septum. "Zeitschr. f. Laryngol.," Bd. iv, Heft 5.

The writer recommends a new form of elevator with a curved shaft and a bulbous extremity. The ordinary elevator is used at first to separate the perichondrium anteriorly, and thereafter the new elevator is used to get round the corner of the deviation, and also to fit into the concavity on the concave side of the septum. The instrument is, however, not suited to separate the mucous membrane from sharp prominences. *J. S. Fraser.*

Glogau, Otto (New York).—Removal of the Bony Septum. "Zeitschr. f. Laryngol.," Bd. iv, Heft 5.

Existing instruments may be divided into two groups, (1) biting and (2) breaking. To (1) belongs those of Freer, Middleton, Hajek, Jansen and Struyken. To (2) the forceps of Krause. Glogau considers that the biting instruments are the best, but objects that they only bite off a small piece at a time; further, the maxillary crest cannot be removed with biting instruments. Glogau has therefore invented two bayonet-shaped double saws, the one horizontal and the other vertical. The bony part of the septum is received between the blades and is first sawn through above, then below and finally behind. The bony deviation can then be removed in one piece. The mucous membrane is not injured as it does not come in contact with the edges of the saw. *J. S. Fraser.*

E.A.R.

Fridenberg, P.—The Ear and Social Hygiene. "Annals of Otol., Rhin. and Laryngol.," vol. xx, p. 784.

A short, thoughtful paper, worth reading, which pleads for a better recognition of the importance of the ear and its function. The eye has come in for a full share of attention and its "comfort" by proper illumination, legibility of type, etc., has been provided for. The ear needs similar assistance from the point of view of "ear strain," by noise, etc. It is pointed out that the aim of conservative otology is to preserve and develop normal hearing and speech, and to prevent aural disease, inferiority or abuse. *Macleod Yearsley.*

Lynch, R. C.—The Role of the Ear as a Complication to General Manifestation of Disease. "New Orleans Med. and Surg. Journ.," July, 1912.

The article draws attention to many of the aural lesions found in the course of general disorders. Otitis media of mild degree, which fre-

quently escapes notice during the progress of acute infectious diseases, often causes changes resulting in permanent functional incapacity of the organ.

Toxic neuritis can be recognised by its sudden onset and progressive course; it most frequently occurs during mumps.

Early in cases of nephritis hemorrhagic infiltration into the tympanum, combined with vertigo and high-tone deafness, form a chain of symptoms almost as characteristic as albuminuric retinitis. Early aural symptoms in myxœdema are progressive loss of hearing with marked tinnitus, vertigo, and nervous irritability. The tympanic cavity may also be filled with serous effusion.

Diabetes is associated frequently with crops of furuncles in the auditory meatus and with severe itching of the same part.

Gout and rheumatism are responsible for deposits in the nerve, middle ear or external auditory canal, and occasionally for sudden hemorrhage into the labyrinth owing to arterial degenerative changes.

Enteric fever causes toxic neuritis and occasionally an active and persistent otitis media during convalescence.

Aural tuberculosis should be suspected whenever an otorrhœa is persistent in a debilitated patient.

Knowles Renshaw.

Murray, R. W. (Liverpool).—The Explosion at Bibby's Oil Works: How the Surgical Emergency was dealt with. (Abstract of portion of the above paper relating to burns of pinna.) "Liverpool Med.-Chir. Journ.," July, 1912.

As a result of the explosion 123 cases of burn were treated at the Northern Hospital, Liverpool, of whom 75 were admitted as in-patients. In the author's opinion the most interesting and remarkable complication was that affecting the ears. In 15 of the cases in which burns of the face and pinnae had occurred, complete healing was followed about four weeks after the accident by sudden and apparently spontaneous swelling. "A man's ears would have a normal appearance one night, and the following morning they were swollen beyond recognition." The swelling involved the whole of the pinna and was not very painful. The burns had been of the second or third degree, and received the same treatment as those of the face, *i. e.* boric acid ointment. In most cases both ears were affected, and in no case could traumatism be accepted as an explanation. A day or two before the swelling appeared the patients experienced a burning or tingling sensation in the ears, and the author is inclined to regard the trouble as of nervous origin. The effusion was in all cases of a serous nature, and in none of them did suppuration occur. The swelling gradually subsided, the cartilage being absorbed, not exfoliated, and very marked deformity was the result. The writer has found no account of a similar condition following upon burns.

Thomas Guthrie.

Frey, Hugo.—A New Method for the Estimation of the Bone-conduction of Sound. "Monats. f. Ohrenheilk.," Jahrg. 45, Heft v.

There can be no doubt that Schwabach's, Weber's and Rinne's tests are all dependent upon the same clinical fact, *viz.* the increase or diminution of bone-conduction. The divergent results obtained when testing bone-conduction even in normal cases by Schwabach, Emmerson, Siebenmann and others were due to their placing the end-piece of the fork on the crown of the head, and then measuring the time in seconds which elapsed between the striking of the fork and the disappearance of

sound-perception. A marked advance was made in the method now employed, by which the fork is placed over the base of the mastoid process, and a measurement is taken of the time in seconds during which the normal ear hears the fork above or below that time during which it was heard by the patient.

The following modification of Schwabach's test has been advanced with the object of enabling us to compare the relationship which exists between air- and bone-conduction, and thereby avoiding at least one of the many sources of error which this method entails. As the test is usually employed this relationship is greatly upset by reason of the fact that the period of vibration of a tuning-fork which is suspended free in air or held lightly between the fingers is much longer than that of the same fork when its stem is firmly planted upon a hard substance. Our measurements are further adversely influenced by the fact that whilst we are transferring the fork from one mastoid process to the other it must for a time swing freely in the air, which still further interferes with the character of its vibrations. These difficulties may be overcome by comparing the pathologically altered bone-conduction with the normal air-conduction in the following manner. The examiner must in the first place determine the constant difference in time between his own bone- and air-conduction for a given tuning-fork: this is known as normal Rinne (*n.r.*). In the second place he must determine the difference between the air-conduction of the patient and his own; this is designated as air-figure (*l.*). He must in the third place estimate the difference between the bone-conduction of the patient and his own air-conduction; this is known as the examiner's differing number (*f.d.*). In estimating bone-conduction the author uses the tuning-fork *e* (Bezold) and *g₂* (Reiner). By the first of these the normal Rinne is in his own case 40 sec. and by the second 21 sec.

Example.—A case of unilateral interference with conduction, confirmed by otoscopical examination. Tuning-fork *e*; *n.r.* = 40, *l.* = 36, *f.d.* = 16. This interpreted means, the air-conduction is diminished by 36 sec., and the bone-conduction is lengthened by 24 sec. (air seconds) compared with the normal. The Rinne test may be reckoned from the above figures. If the patient's air-conduction were normal the Rinne would work out + 16 (40–24), but we know from *l.* that air-conduction is diminished by 36 sec. Therefore in this case the Rinne would be – 20. The opinion is held that the estimation of bone-conduction if carried out in this manner will give more accurate results, and lead to a truer interpretation of the variations in bone-conduction which occur with different tones and in different diseases.

J. B. Horgan.

MISCELLANEOUS.

Thost, A. (Eppendorf).—Gout in the Upper Air-passages. "Archiv für Laryngol.," vol. xxvi, Part II.

After some reference to the nature of gout and to the relation of diseases of metabolism in general to the mucous membranes, the writer considers the diagnosis of gout of the upper air-passages. In his opinion we are justified in arriving at a diagnosis of gout of these regions—(1) when there is a family tendency to the disease; (2) when gout has been proved to be present by examination of the purin metabolism, or when the upper air-passages are affected during acute attacks of gout elsewhere;

(3) when cutaneous gout is also present; (4) when, ordinary treatment having failed, treatment directed against gout succeeds.

The relationship of gout and hay-fever is discussed, and this is followed by a detailed description of the manifestations of gout in the different portions of the upper respiratory tract together with the histories of eleven illustrative cases.

Thomas Guthrie.

Bunch, J. L.—Heredity Syphilitic Infants treated by Intra-venous Injections of "606." Section for the Study of Disease in Children. "Proc. Roy. Soc. Med.," December, 1911.

The child was eight weeks old and presented the usual thin, old appearance. The skin was covered with a maculo-papular rash and there were fissures at the angles of the mouth; the child had snuffles; W R + . On June 21, 0.03 grm. salvarsan injected intra-venously; three days later the eruption had diminished. Six days later an intra-muscular injection was given, and a week after this all syphilitic lesions had disappeared. Dr. Bunch states that the results of intra-venous injection have not been very successful in infants, and that intra-muscular injections have been associated with sloughing of the tissues.

J. S. Fraser.

Spiller (Pennsylvania).—Loss of Emotional Movement of the Face with Preservation or Slight Impairment of Voluntary Movement in Partial Paralysis of the Facial Nerve. "Amer. Journ. Med. Sci.," March, 1912.

The author has observed this phenomenon, especially in instances of tumour of the cerebello-pontine angle pressing on the facial nerve. It is important to recognise that this form of dissociation of facial movement may be the first sign of interference with the facial nerve from pressure of such a tumour, and in connection with slight nerve deafness may be of localising value.

Thomas Guthrie.

REVIEWS.

Patologia, Anatomia e Fisiologia della Tonsilla Faringea. By Dr. FRANCESCO MALTESE. Pp. 261 with 6 plates and 20 figures. Libreria Medica, 33, Via Massimo, Torino, Italy.

It was with some misgiving that the writer undertook to review "yet another adenoid book," and accordingly hesitated to attempt the, for him, necessary task of perusal before the leisure of the long vacation. This, such as it is, is the only excuse he can offer for the delay in the appearance of a notice of a work well worth attention. Dr. Maltese has rendered a valuable service to the history of medicine and surgery in our special department. In such a well-worn field as that of diseases of Luschka's tonsil there is small opportunity of saying anything that has not already been said over and over again. Indeed, it is only when one has occasion to study a work of this class that one obtains anything like a complete view of the immense amount of labour and research that has been devoted to this subject in all civilised countries during the greater part of the nineteenth century and especially since the publication of Wilhelm Meyer's paper in 1878. In the history of "the concentration of great minds on the elucidation of a small subject" the work of Dr. Maltese will have an honoured place, furnishing, as it does, what is

apparently a complete "Index Medicus" to the literature of the pharyngeal tonsil as well as a useful practical criticism of the views of the principal writers. The pathological section, which occupies a large part of the volume, abounds with citations from all the well-known authorities, and is illustrated by several well-executed reproductions of micro-photographs. It is, perhaps, a disadvantage, which may have some disciplinary compensations, that these illustrations are so remote from the text, while, in order to obviate any disappointment to possible purchasers of the book, it may be well to add that eighteen of the twenty figures referred to in the title are amongst those which appear on the six plates.

One of the most interesting sections is that entitled "Adenoïte Difteriea Primitiva," with a full description of the views of Roëaz, Morfan, Freeman and many others who have worked on this branch of the subject during the last fifteen years. The view that primary diphtheria of the pharyngeal tonsil may exist as a distinct morbid entity with its own peculiar clinical history is already well established, and, though it has been comparatively rarely observed without infection of the fauces, may serve to account for many of those cases of post-diphtheritic lesions in which there was apparently no evidence of a previous throat affection.

The chapter dealing with the operative treatment is somewhat brief and based only on the author's personal experience of Continental methods. He favours the operation in the sitting posture by curette, preferably Gottstein's. He gives but a scant account of other methods, as, for instance, that where the enucleation of the adenoid tissue is followed by the use of the curette. We have here in analogous form the tonsillotomy *versus* enucleation question. Unfortunately the author's numerous quotations of the views of well-known authorities seem, in the absence of reliable statistics of comparative recurrence, only to show once more that in the multitude of counsellors there is confusion. As to the choice of an anæsthetic, from a long hospital experience he is somewhat more enthusiastic for ethyl chloride or bromide than would probably be the case with the majority of experienced operators on this side of the Channel. However, while the author's opinions throughout the work are valuable as those of one who has devoted much labour and original research to the subject, the chief interest of the book will be as a guide to the already immense literature, and it is as such that it can be recommended to our readers.

James Donelan.

The Prescribers' Formulary and Index of Pharmacy. By THOMAS PUGH BEDDOES. London: Baillière, Tindall & Cox, 1912.

This is one of those small and handy books on pharmacy and prescription-writing for which there must always be a demand. Small enough to be carried in the waistcoat-pocket, Mr. Beddoes' compilation, nevertheless, seems to be lacking in nothing, save perhaps in a general index. The subject-matter is arranged in a convenient and accessible form; and, as far as we have examined it, misprints or errors in dosage seem to be remarkably few in number. The sections containing the preparations on the throat, nose and ear will be found to be very complete.

Mr. Beddoes may be congratulated on the patience and assiduity that have enabled him to conquer the tedium of completing so satisfactorily a work in which meticulous care is the first and last essential.

Don McKenzie.



FIG. 13. Coloured drawing, $\times 450$. Showing a medullated fibre passing to and ending in the epithelial layer.

TO ILLUSTRATE DR. W. E. ROSS'S ARTICLE ON SOME OBSERVATIONS ON THE NERVE SUPPLY OF THE INFERIOR TURBINAL AS SHOWN BY VITAL STAINING.

THE
JOURNAL OF LARYNGOLOGY,
RHINOLOGY AND OTOTOLOGY.

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**SOME OBSERVATIONS ON THE NERVE SUPPLY OF THE
INFERIOR TURBINAL AS SHOWN BY VITAL STAINING.¹**

By T. W. E. Ross, M.D., F.R.C.S.E.,

Late Clinical Assistant to the Ear, Nose and Throat Department of the
Royal Infirmary, Edinburgh.

THE following is an account of the nerve structures in the inferior turbinal, founded upon the examination of twenty-five specimens removed by operation and stained by the intra-vitam methylene-blue method:

The specimens examined were mostly of hypertrophic type; œdematous turbinals were not examined.

The method of staining was briefly as follows:

The freshly removed turbinal was freed from any splinters of bone, and cut into sections about one eighth of an inch thick. These were washed in warm saline, and then transferred to a $\frac{1}{20}$ per cent. solution of methylene-blue (nach Ehrlich) in normal saline. In this the tissue was kept for about half an hour at blood heat. It was then placed in a Petrie's dish and exposed to the air for about half an hour in an incubator at blood heat, and kept moist with saline. For fixation the tissue is then placed in an 8 per cent.

¹ From the Ear, Nose and Throat Department of the Royal Infirmary, and the Research Laboratory of the Royal College of Physicians, Edinburgh.

solution of ammonium molybdate (Merck) at 35° F., where it may be left twelve hours. The tissue was then washed in cold running water for half an hour, preparatory to a process of dehydration in 96 per cent. spirit and absolute alcohol, as described by J. Gordon Wilson.

The stain is very apt to be dissolved out of the finer nerve elements in this process of dehydration. I obtained more satisfactory results by carrying specimens through as described up to the point of dehydration, and then cutting sections with the



FIG. 1.—Photograph, $\times 200$. Antero-posterior vertical section towards posterior end of inferior turbinal. A. One of the main nerve-trunks. B. A tortuous branch passing towards surface.

freezing microtome. The sections, as cut, were dried with blotting-paper passed rapidly through absolute alcohol and xylol, and mounted in Canada balsam.

The sections were purposely cut rather thick to afford a better chance of tracing the individual nerve-fibres in their ramifications. This fact, together with the character of the stain, rendered the making of micro-photographs a difficult matter, especially with the high powers necessary to show the finer nerve-fibrils. The photographs shown here are quite untouched, and merely give an indication of what can be seen in the sections.

The general appearance of a section stained in this manner is as follows :

The columnar epithelium, which is very apt to disappear in the process, is, if still present, well stained. Some cells appear to take up the stain more readily than others. These, for the most part, appear to be supporting cells, with a large rounded granular nucleus, and with tapering ends, of which one does not quite reach the surface, whilst the other extends as a fine thread-like process to the basement membrane.



FIG. 2.--Photograph, $\times 200$. Showing nerve-fibres in one of the deeper nerve-branches.

The basement membrane is not stained and shows as a well-defined homogeneous-looking line, immediately under which are great numbers of fine capillary loops. These loops form regular arcades, the rounded convexities of which are often in actual contact with the basement membrane. The capillaries and their contents are well stained, but the supporting tissues are only faintly stained. There is always evidence of a small round-celled infiltration in this capillary zone, and the cells forming it are stained in varying degree.

In what follows reference is made to this zone of small capil-

laries and their supporting tissues as the subepithelial-layer. Beneath this layer are the mucons glands and the blood-spaces with their surrounding elastic and involuntary muscular tissue. These tissues are only faintly stained. In sections where the nerves have taken on the stain and retained it during the preparation for examination they stand out very clearly from the surrounding tissues. All shades of blue may be seen, but the axis cylinders and fibrils are generally dark blue. The medullary



FIG. 3.—Photograph, $\times 60$ Transverse vertical section through inferior turbinal about its middle portion, showing: (A) Subepithelial capillary. B. Nerve-fibres forming a superficial bundle running parallel to surface. C. Basement membrane denuded of epithelium.

sheath of the medullated fibres is often stained a mauve colour. The axis cylinders and fibrils often present a beaded or varicose appearance.

The nerve supply of the inferior turbinal is derived from the two inferior nasal nerves, which are given off from the great or anterior palatine nerve. They emerge from two minute apertures in the vertical plate of the palate bone, the upper branch at a level between the middle and inferior turbinals, the lower immediately behind the posterior end of the inferior turbinal.

The former supplies the upper and the latter the antral surface of the turbinal.

In sections stained with the vital method the larger nerve-trunks are well seen. They enter posteriorly and run forwards near the bone, generally in company with an artery and a vein. Numerous branches are given off, which run more or less obliquely towards the surface. These branches are generally very tortuous, which is probably a provision to prevent their interference with the free expansion of the turbinal. Fig. 1 ($\times 200$) shows one of



FIG. 1.—Photograph, $\times 200$. Transverse vertical section of inferior turbinal, showing: A. Basement membrane. B. Superficial bundle of nerve-fibres. C. Fibres branching off from bundle.

the larger nerve-trunks giving off a branch which pursues a tortuous path towards the surface.

Fig. 2 ($\times 200$) shows a large trunk branching. These branches on nearing the surface split up irregularly into bundles, in which five or six medullated fibres can often be counted. The bundles of fibres run parallel to the surface in the deeper portion of the subepithelial zone. They can be seen both in vertical transverse and in vertical antero-posterior sections of the inferior turbinal. Bundles shown in longitudinal section in the one case appearing in cross section in the other, though the latter are not so easy to identify. The average width of the bundles is from 20 to 30 μ .

Three different appearances are presented by the component fibres :

(1) Those with a double contour and mauve-coloured granular content, showing at intervals well-marked nodes, where a blue-stained axis cylinder may be seen. They are about 2μ in diameter. These are certainly ordinary medullated fibres.

(2) Those, which are also about 2μ in diameter, but show no double contour, are stained uniformly dark blue, and have no

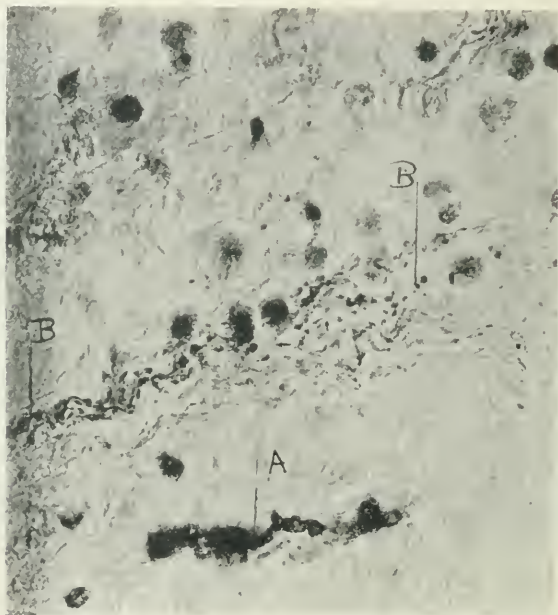


FIG. 5.—Photograph, $\times 200$. Transverse vertical section about junction of middle and anterior thirds of inferior turbinal, showing: A. Cells in a subepithelial capillary. B. A nerve-fibre breaking up into a leash of terminal fibrils.

nodes nor varicosities. These are perhaps also medullated fibres which have reacted differently to the stain.

(3) Those of much smaller diameter, about $.5\mu$, hair-like in appearance, with numerous beads on their course, which are apparently non-medullated fibres.

In Fig. 3 is seen a low-power view, and in Fig. 4 a higher power view, of such a bundle. From these bundles nerve-fibres of all varieties are given off to their ultimate distribution, which may be classified as follows :

(1) Fibres going to the blood-spaces and the non-striped

muscular tissue surrounding them, to the blood-vessels and to the glands.

Although the more deeply situated of these structures are supplied by fibres coming directly from the deeper nerve-trunks, yet quite a large number of fibres may be traced from the superficial bundles running downwards to supply the deeper structure. These fibres, which appear to be of the non-medullated variety, split up into beaded fibrils, some of which join similar fibrils to form a plexus amongst the blood-spaces and glands, others ter-

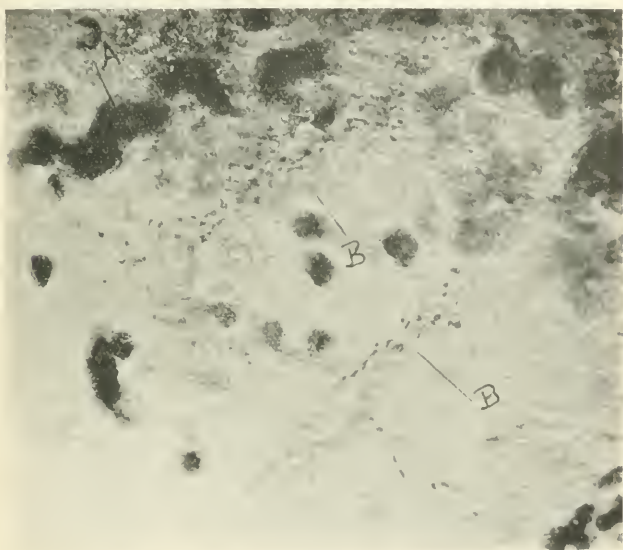


FIG. 6.—Photograph, $\times 1000$. Transverse vertical section through anterior portion of inferior turbinal, showing: A. Cells in subepithelial capillary. B. Leashes of parallel fibres forming a plexus.

minate in bulbous endings in the involuntary muscular tissue or under the endothelium of the blood-spaces. Numerous fibrils can be seen ending in proximity to the cells of the gland acini, but in my sections the exact nature of their ending could not be determined.

Not infrequently a well-marked plexus of minute nerve-fibrils can be seen surrounding the smaller veins or larger capillaries.

(2) Fibres ending in the subepithelial layer are numerous, and their distribution complicated. Several types of nerve-ending may be found.

(a) Certain nerve-fibres, apparently of the non-medullated

variety, break up into a leash of very fine fibrils, which, under the oil-immersion lens, look like fine hairs dotted with minute beads, and each of which terminates in a little bulbous ending. Sometimes these minute fibrils are branched. Such a leash is found between the subepithelial capillaries, and its fibrils appear to have no connection with other nerve-fibrils (Fig. 5).

(b) Another nerve-fibre, also non-medullated, may break up into a leash of minute varicose fibrils, which run more or less

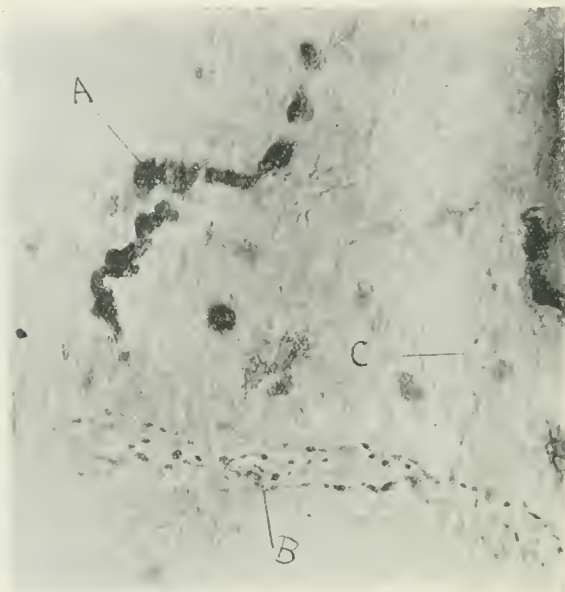


FIG. 7.—Photograph, $\times 1000$. Transverse vertical section through anterior portion of inferior turbinal, showing: a. Cells in subepithelial capillary. b. A leash of parallel fibrils forming portion of a plexus, the other components of which do not focus on the same plane. c. Fibrils given off from the leash to capillary.

parallel in a wavy course. This leash forms a plexus with similar groups of fibrils derived in a similar manner. The plexus thus constituted lies amongst the sub-epithelial capillaries, and from it numerous fibrils are given off, which go to the capillaries. These fibrils sometimes end in minute bulbs in relation to the capillary endothelium, sometimes they are seen to accompany the capillary, surrounding it in a plexiform manner. This plexus of nerve-fibril leashes is most evident in the anterior portion of the turbinal. Figs. 6 and 7 give an indication of the characters of the plexus; in the latter a fibril may be seen going to a capillary.

(c) A medullated fibre is often seen to run its course in the sub-epithelial layer, where it gives off, and finally breaks up into, numerous fibrils. Of these, some are given off to capillaries or to the more superficial blood-spaces, whilst others, and more especially the terminal fibrils, go to form a plexus in the subepithelial layer. This plexus, in the formation of which fibrils from non-medullated fibres also appear to take part, is in contrast to the plexus of leashes already described, in that it is wide-meshed and its fibrils run singly and unite with each other very irregularly. It is of fairly even distribution throughout the whole subepithelial layer. A portion of such a plexus is shown in Fig. 8 ($\times 1000$).

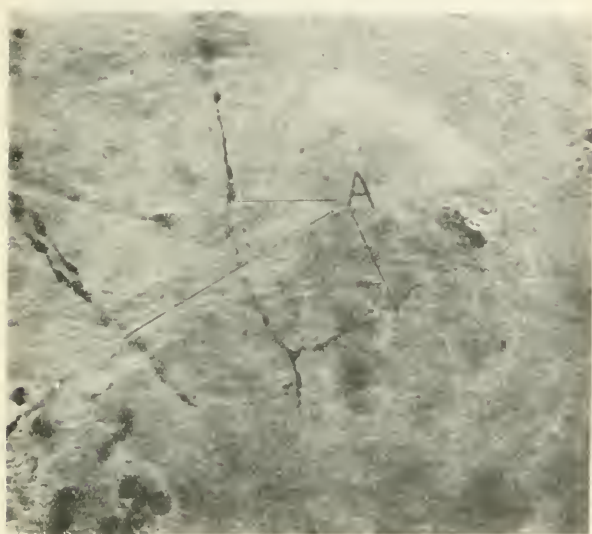


FIG. 8.—Photograph, $\times 1000$. Transverse vertical section through posterior end of inferior turbinal, showing: A. Nerve-fibrils taking part in the formation of a wide-meshed plexus.

Often a medullated fibre destined to pierce the basement membrane for the supply of the epithelium is seen to give off minute fibrils to capillaries lying near its course. Such can be seen in Fig. 10 ($\times 1000$).

(d) Another type of ending is shown in Fig. 11. It is formed by a fine non-varicose fibre, which, making a loop on itself, ends in a fairly large bulb. This is found in the connective tissue between the subepithelial capillaries.

(e) In several sections one has noticed a nerve-fibre of the medullated variety forming a series of convolutions and apparently ending in an oblong ring or bulb with a granular margin and a

clear centre. This is shown in Fig. 12, but the above description applies to a higher magnification than that with which the drawing was made. These convolutions are found in the deeper part of the subepithelial layer.

(3) Fibres, which end in the epithelial layer, are found of fairly equal distribution over the turbinal. The following is a description of such an ending, as seen with the oil-immersion

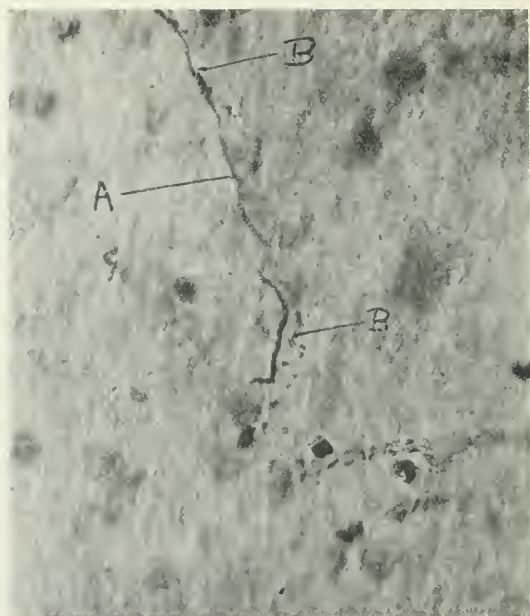


FIG. 9.—Photograph, $\times 1000$. Transverse vertical section, showing: A. Medullated fibre destined for supply of epithelium. B. Non-medullated fibre accompanying the former.

lens, in a transverse vertical section near the anterior end of the turbinal:

A well-defined, deeply stained fibre, of about 2μ in diameter, follows a rather tortuous course through the subepithelial layer towards the basement membrane. Nodes are seen at intervals, but there is no varicosity. It is evidently a medullated fibre. Before reaching the basement membrane four very fine fibrils are given off. Of these, one ends in a tiny bulb immediately below the basement membrane, whilst three pierce that structure. Of these, two end in little bulbs on its epithelial surface, the other ends midway between the basement membrane and the ciliated surface



FIG. 11.



FIG. 12.

FIG. 11. - Coloured drawing, $\times 400$. Showing a nerve-ending in sub-epithelial layer.

FIG. 12. - Coloured drawing, $\times 400$. Showing a nerve ending in sub-epithelial layer.

TO ILLUSTRATE DR. W. E. ROSS'S ARTICLE ON SOME OBSERVATIONS ON THE
NERVE SUPPLY OF THE INFERIOR TURBINAL AS SHOWN BY VITAL STAINING

in two little bulbs connected to it by stalks so fine as to be hardly visible with the highest power.

At the points where these fibrils emerge there are distinct thickenings on the fibre. The largest of these fibrils is about 4μ in diameter, the smallest about half that. The fibre, somewhat diminished in size, pierces the basement membrane and at once gives off a fine fibril, which runs between the columnar cells towards the surface and ends in a grape-like cluster of little bulbs. The stalks of the bulbs are only visible with the highest power. The fibre then curves over towards the basement membrane, with which it runs

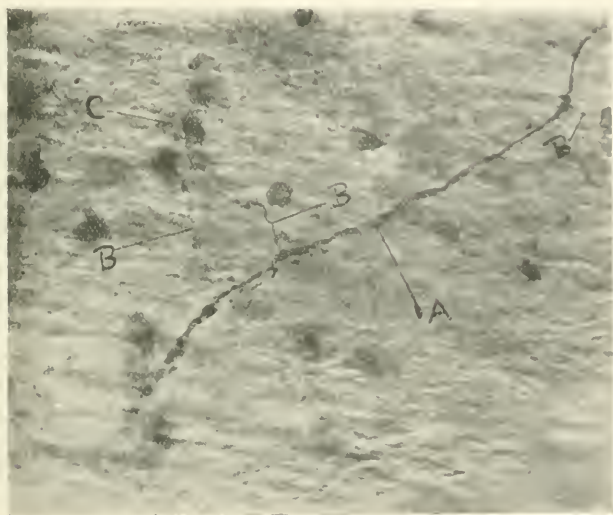


FIG. 10.—Photograph, $\times 1000$. Another view of preceding section, showing:
A. The medullated fibre. B. Fibrils given off to sub-epithelial capillaries.
C. Cells in the latter.

parallel. It exhibits a series of irregular thickenings, gives off another very fine fibril, which, after a short course towards the surface, ends in two tiny bulbs, and then itself ends in a series of bulbs connected by very fine threads (Fig. 13).

As previously indicated, fibres ending like the above in the epithelium may sometimes be seen to give off fibrils to capillaries in the sub-epithelial layer (Fig. 10). Sometimes the fibre is seen to be accompanied by a smaller beaded fibre, apparently of the non-medullated variety. In Fig. 9 the large dark fibre, about 2μ in diameter, is running just below the basement membrane. It is accompanied by a fine varicose fibre, which is well seen in the section, but only faintly in the photograph. The larger fibre,

beyond the point photographed, gives off numerous fine fibrils, which penetrate the basement membrane to end amongst the epithelial cells, and finally itself pierces the membrane, ending in a row of beads connected by very fine fibrils. The fine varicose fibre is not seen to pierce the basement membrane. In no instance have I seen any direct connection between a nerve-fibril and any of the columnar epithelial cells, though some of the fine processes of the supporting cells take on the stain in a very similar manner to the nerve-fibrils.

From the facts stated, it is obvious that the inferior turbinals have an abundant and complex nerve supply. The complexity is greatest in the sub-epithelial layer. Here several varieties of nerve-ending are found, the most striking of which is the plexus formed by leashes of nerve-fibrils, best seen towards the anterior portion of the turbinal. The medullated fibres seem principally destined to end in the epithelium, but those which do generally give off fibrils to capillaries and other structures in the sub-epithelial layer. Some medullated fibres end in the sub-epithelial layer, their ultimate fibrils going to form the wide-meshed plexus already described. The nerve supply of the sub-epithelial capillaries is very rich. Fibrils pass to them from both varieties of fibre, and also from the terminal plexuses of fibrils.

In conclusion, I desire to express my indebtedness to Dr. Logan Turner for permission to use material derived from his department in the Royal Infirmary of Edinburgh, and to Dr. Cranston Low for kindly making the three-coloured drawings of nerve-endings.

REFERENCES.

- (1) J. GORDON WILSON.—"Intra-vitam Staining with Methylene-blue." *The Anatomical Record*, vol. iv, No. 7, July, 1910.
- (2) "Quain's Anatomy."

**REPORT FOR THE YEAR 1912 FROM THE EAR AND THROAT
DEPARTMENT OF THE ROYAL INFIRMARY, EDINBURGH.**

Under the charge of A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E.

PART I.

**AN ANALYSIS OF 76 CONSECUTIVE OPERATIONS ON
THE FRONTAL, MAXILLARY, ETHMOIDAL AND
SPHENOIDAL SINUSES.¹**

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IN continuation of the policy of publishing the results of operations (JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, March and April, 1912), the present writers present the following account of 76 operations on the nasal accessory sinuses, performed by one of them (J. S. F.) during the last six years. Cases of acute sinusitis treated by inhalations, hot-air baths and proof puncture are *not* included.

The 76 operations were performed on 66 patients, and have been classified as follows:

A. *Fronto-ethmoidal Suppuration*, 11 cases (6 cures, 2 improved, 1 failure; 1 did not report; 1 death from meningitis, which was present on admission; 1 patient died subsequently from phthisis pulmonalis). In 6 of the 11 cases antral suppuration was also present.

B. *Antro-ethmoidal and Antral Suppuration*—52 cases. The following operations were performed:

(1) Forty-two cases. Radical operation (Caldwell-Luc) on the maxillary antrum combined in 20 of the cases, with intra-nasal operation on the ethmoidal cells. (Sixteen cured; 16 improved—ethmoidal suppuration still gives trouble; 1 failure; 7 patients did not report; 2 deaths some years after operation from other causes.)

(2) Eight intra-nasal operations on the maxillary antrum, combined in 4 cases with intra-nasal operation on the ethmoidal cells. (Six cures; 2 patients did not report.)

(3) Alveolar operation—2 cases. (Two cures.)

¹ Read at the Scottish Otological and Laryngological Society's meeting on November 20, 1912. The discussion on this paper will appear in a later issue of the JOURN. OF LARYNGOL., RHINOL., AND OTOL.

c. *Periodontal Dental Cysts*—4 cases. (Two cures; 2 patients did not report.)

d. *Ethmoidal Suppuration*—3 cases; intra-nasal operation in 2 (1 cure; 1 improved). External operation on both sides in one case; result still uncertain

e. *Sphenoidal and Posterior Ethmoidal Sinuses*—6 cases (given in detail). In two of these antral suppuration also present.

It is worthy of note that out of the 66 cases in which suppurative catarrh was present in the accessory sinuses the ethmoidal cells were involved in 38 instances (11 fronto-ethmoidal; 20 antro-ethmoidal; 3 ethmoidal; and 4 sphenoid-ethmoidal). The writers regret that, owing to distance of the patients from Edinburgh and change of address, they have been unable to follow up 14 of the cases.

A. **Fronto-Ethmoidal Suppuration.** (Killian operation; 11 cases).

The age of the patients varied from 16 to 60 years; second decade, 2; third, 5; fourth, 3; and seventh, 1. Two of the cases were subacute (6 weeks and 3 months respectively), while the rest were chronic. One of the subacute cases was treated by means of the head-light bath (Brünings), but without result.

Symptoms.—Nasal discharge was noted in all but one case, in which an external fistula was present. Nasal obstruction was a prominent symptom in 3 cases. Three patients complained of loss of the sense of smell, and 3 of a subjective foal odour. Eight patients complained of frontal pain or headache, and in 5 instances this pain showed marked periodicity, coming on in the forenoon, and passing off about 4 p.m. Five of the patients had previously had polypi removed on one or more occasions. One patient was admitted with intra-cranial symptoms.

Examination.—In two cases the external nose was expanded. Four patients had a swelling at the upper inner angle of the orbit, while one had a fistula in this region and another a depressed scar. Intra-nasal examination showed absence of pus in one case, pus but no polypi in one case, œdema of the middle turbinal and pus in three cases, while in the six remaining patients pus and nasal polypi were present.

Trans-illumination and Radiography.—In four unilateral cases the affected frontal sinus was dark, while the healthy side illuminated. In three bilateral cases both frontal sinuses were dark, and in only one case did the diseased sinus illuminate. (No note

as to three cases.) In five of the patients the presence of frontal sinusitis and the outlines of the cavity were shown by the X rays. No note in six cases.

Operative Technique.—The anæsthetic employed was chloroform. The nose was packed with gauze soaked in cocaine solution with a little adrenalin. A sponge was introduced into the naso-pharynx.

The Killian operation was performed in all cases, the upper part of the sinus being first dealt with. In the second part of the operation difficulty was experienced in three cases in gouging through the frontal process of the superior maxilla without causing extensive fracture of the bone. In none of the cases was the attachment of the superior oblique muscle preserved. After the anterior ethmoidal cells and orbital extension had been dealt with, the middle turbinal was removed through the anterior naris by means of Luc's forceps. No attempt was made to preserve the mucous membrane of the lateral wall of the nose, but that covering the under surface of the incisura ethmoidalis was not enretted. The ethmoidal cells were next removed back to the anterior surface of the body of the sphenoid with Grünwald and Luc's forceps. The cavities were then swabbed out with peroxide of hydrogen and packed with iodoform worsted, which was removed at the end of twenty-four hours. In the majority of cases the cavities were also drained for a few days by means of worsted introduced at one or more points along the line of incision. At the end of this period these drains were omitted, and the line of incision was closed by tightening the loose stitches which had been passed at the time of operation.

Findings at Operation.—In all cases the sinuses contained pus and thickened polypoid mucosa. In one case there were erosions in the lachrymal bone and os planum of the ethmoid, while in another there was a fistula in the floor of the frontal sinus. In a third case rhinitis caseosa was present.

In the one fatal case an extra-dural abscess was discovered at the second operation. (The case is given in full below.)

Complications.—One patient developed pleuro-pneumonia and empyema, necessitating the removal of a portion of rib. (Mr. J. W. Dowden kindly operated, and the patient recovered.)

In a second case the wound had to be re-opened on account of necrosis of the bridge and commencing osteomyelitis. At the second operation the wound was left open and packed. The patient got well. In a third case there was retention of pus in the upper portion of the sinus, necessitating a second vertical incision

and drainage for a week or two. In five cases diplopia was noted after operation. In one case there was no diplopia, and in five this point is not recorded.

Results.—Complete cure in six cases. In two there was still some discharge from the upper part of the cavity when the patient was last seen. One patient reports that she is not improved. In one case the result cannot be ascertained, while one patient died of meningitis, which was, however, present on admission to hospital. Most of the patients complained for considerable periods after operation of a feeling of “numbness” or of “pins and needles” over the forehead on the side of operation.

Fatal Case.

This case has already been recorded (JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, vol. XXVI, 1911, p. 45), but is given here for the sake of completeness, and also because there were several inaccuracies in the last report.

Female, aged twenty-one, suffered from cold in the head for six weeks before admission to one of the medical wards of the Royal Infirmary. During the whole of this period she had nasal discharge, and for the last fortnight frontal headache and swelling above the left eye. Five days before admission she suffered from vomiting, shivering, and general pains, and during the last three days the nasal discharge ceased. On admission to the medical ward the temperature was 102° F. and the pulse 104. She was drowsy, and lay on her right side with her knees flexed. Percussion of the skull caused pain, especially over the left frontal region. Examination of the ocular fundus showed engorgement of the veins. There was no strabismus. The sense of smell appeared normal. There were no paralytic phenomena, and the reflexes were normal. Spinal puncture yielded a clear fluid containing albumen; there was, however, no increase in pressure, and no cells or organisms; Fehling-reducing substance was present. A blood-count showed 12,700 leucocytes; polymorphs 90 per cent.

On the day following admission there was a rigor and the temperature rose to 105° F. In Dr. Turner's absence one of us (J. S. F.) saw the patient, and found pus in the left middle meatus and tenderness over the left frontal region. A diagnosis was made of acute frontal sinusitis with possibly an intra-cranial complication. Operation was performed at once, and the left frontal sinus was found full of pus. An opening was made through the intersinusal septum into the right sinus, which was found in a similar condition, but no bone disease was found in the posterior wall of either sinus. The anterior ethmoidal cells on the left side were found to contain pus, and were cleared out along with the left middle turbinal. A second lumbar puncture was performed on the operating table, and yielded clear sterile fluid under tension. Two days after operation left internal strabismus developed. The patient remained drowsy, but complained of headache when questioned. In consultation with Dr. Edwin Bramwell it was decided to explore the left frontal lobe.

Second Operation.—The posterior wall of the left sinus was removed, and immediately stinking green pus escaped, and a large extra-dural abscess containing at least one ounce of pus was evacuated. The dura mater was seen to be rough and red over an area the size of a five-shilling piece. Cultures from the extra-

dural abscess gave staphylococci, streptococci, Gram-negative reniform diplococci resembling *Micrococcus catarrhalis*, diphtheroid bacilli, leptothrix (Gram +), and small Gram-negative bacilli like *B. influenzae*. As the dura mater bulged markedly it was incised and the frontal lobe explored, but with negative result. A hernia cerebri quickly formed. A third lumbar puncture was performed, and yielded clear fluid under less tension than on the second occasion. Five mgrm. of collargol were injected in the spinal canal. The patient became comatose and died on the following day.

Post-mortem Examination.—On the right cerebral hemisphere there was a thick intra-dural coating of yellow and very offensive pus; on the left there was much less. There was little or no subarachnoid collection. There was practically no pus at the base of the brain, except on the under-surface of the right temporo-sphenoidal lobe. There was no obvious communication with the nose.

B. (1) *Antro-ethmoidal and Antral Suppuration.*

Fifty-two patients were operated upon. Of these, 36 were unilateral and 16 were bilateral, so that in all 68 operations were performed.

The age of the patients varied from 13 to 56 years: second decade, 11; third, 19; fourth, 15; fifth, 6; and 1 in the sixth decade.

The radical operation (Caldwell-Luc) was performed on 42 patients: Left antrum, 17; right antrum, 11; both antra, 12 (52 operations). Twelve intra-nasal operations were performed (8 cases): 2 on the left antrum, 2 on the right, and 4 on both.

In 2 cases of dental origin the diseased tooth was extracted, and the antrum opened and washed out by the alveolar route.

Symptoms (52 cases).—Nasal obstruction was complained of in 27 cases, and nasal discharge in 48. The sense of smell was lost in 6 cases, and impaired in 3, while 27 patients complained of subjective bad smell or taste. (Others not noted.) Headache, usually frontal, was a marked symptom in 20 cases, while 2 patients complained of pain over the bridge of the nose, and 3 of occasional pain in the cheek. Nineteen patients had previously had polypi removed on one or more occasions.

Examination.—In 2 cases the external nose was expanded, while in 2 others there was a tender swelling on the right side of the nose in the region of the lachrymal bone. One of these subsided, but the other had to be opened and drained.

Intra-nasal Examination showed the presence of polypi in 23 cases, in 8 of which the polypi presented in the choana. In 16 other cases the middle turbinals were adenomatous or polypoid. In 6 cases the inferior turbinals also showed adenomatous enlarge-

ment. In only 2 cases was atrophy present. Pus was observed in the nose in all but 2 cases; in 38 by anterior rhinoscopy in the middle meatus, and trickling over the inferior turbinal far back in the nose; in 11 cases the pus was only observed by posterior rhinoscopy on the posterior end of the inferior turbinal. The posture test was employed in 17 cases, and was positive in 13, but negative in 4.

Transillumination.—This is noted in 61 instances out of 68. Antrum dark in 48 cases, feeble illumination in 8, and in 5 the affected antrum lit up well. (Of the 8 cases in which choanal polypus was present, 4 were dark, 2 illuminated feebly, and 2 were light.) Forty-five antra were proof-punctured before operation—in 39 cases foul-smelling pus was present, while in 6 only muco-pus was washed out. (Note: In the bilateral cases only one antrum was punctured as a rule.)

Radical Operative Technique.—General anaesthesia: Nose packed with gauze saturated with cocaine and adrenalin; sponge in cheek to absorb blood. Usual incisions at junction of lip and gum. Antrum freely opened with gouge and hammer, aided by Jansen's forceps. Mucosa inspected, and, if necessary, curetted out. Large opening made in inner wall, and bony ledge smoothed off so as to bring antral and nasal floors as nearly as possible to same level. Flap of mucous membrane cut and turned down from outer wall of inferior meatus. Anterior end of inferior turbinal removed by means of Struycken's forceps, applied first through anterior naris and then through the new antro-nasal opening. Cavity of antrum swabbed out with peroxide of hydrogen, and packed with iodoform worsted, which was removed next day. Mouth wound closed with catgut stitches. In those cases in which ethmoidal suppuration was present the anterior end of the middle turbinal was removed with Luc's forceps applied through the anterior naris, and the ethmoidal region opened up with Hajek's hook and Grünwald's forceps. In one case of bilateral disease, in which the symptoms pointed to involvement of the posterior ethmoidal cells and sphenoidal sinus, an opening was made through the membranous part of the middle meatus after the radical operation had been completed; the posterior ethmoidal cells were broken down and curetted, and the sphenoidal sinus was opened on both sides; the access was, however, not good, and bleeding greatly interfered with the operation.

Findings at the Radical Operation (53 operations on 42 patients).—Thirty-seven antra contained polypoid mucosa and pus. Five of these were choanal cases. The mucosa was almost entirely removed.

Five antra contained polypoid mucosa, but no pus. Three of these were cases of choanal polypi.

Ten antra contained pus, but the mucosa was not polypoid.

In one case the antral mucosa appeared normal, and the mouth wound was closed without making a counter-opening into the nose. Subsequently, however, suppuration developed in the cavity, and it was found necessary to complete the radical operation.

Complications.—Three patients developed a scarlatiniform rash a day or two after operation and were sent to the fever hospital (were these really cases of scarlet fever, or only cases of septic rash?). In only two cases did the mouth wound fail to heal, but a certain amount of swelling of the cheek was common after operation, and in two cases was very marked. One patient had more or less fever for fourteen days after the operation, but eventually made a good recovery.

Results of Operation.—Of the 42 patients, 8 have not reported; of the remaining 34, fifteen were cured, 16 improved, 1 case was a failure, and 2 patients died several years after the operation from pulmonary tuberculosis.

In the cases in which complete cure was not obtained the continuance of the ethmoidal suppuration was responsible.

B. (2) *Intra-nasal Operation on the Antrum.*

Eight cases—4 bilateral and 4 unilateral.

The symptoms and state on examination has already been given; the cases selected for intra-nasal operation were those of comparatively short duration.

Technique.—Local anæsthesia was employed in all cases.

The anterior end of the inferior turbinal was freely removed, and thereafter the outer wall of the inferior meatus was packed with gauze soaked in cocaine and adrenalin. The inner wall of the antrum was then opened with Tilley's burrs, and the opening enlarged backwards by means of Grünwald's forceps, and forwards with Wagener's forceps.

In several cases it was found difficult to make the opening as large as was desired, and subsequently this opening became considerably narrowed in one or two cases.

Results.—Of the 8 cases, 6 were cured and 2 have not reported.

B. (3) *Alveolar Operation on the Antrum.*

This procedure was only carried out in two cases, in both of which antral suppuration was due to disease of the first molar tooth. The

tooth was extracted and the antrum opened and washed out through the socket. A cure was obtained in both cases within two months.

c. Periodontal Dental Cysts (4 cases).

The ages of the patients were 10, 22, 26, and 30 years.

Symptoms.—In three cases the patients complained of purulent discharge from the socket of a tooth which had been extracted—in one case seven weeks before admission, in the second case five months, and in a third case five years before coming to the Infirmary. The fourth case—a child, aged ten—was brought on account of a swelling on the left cheek, which had been present for one year. In none of the cases was there any complaint of nasal discharge.

Examination.—In two cases the cheek was swollen, and the naso-labial fold seemed obliterated. In both of these cases, and in one other, the anterior surface of the body of the superior maxilla was felt to be bulging forward. In the fourth case no swelling was evident to eye or finger, and the radiograph suggested antral disease; the true condition was only discovered at operation. In three of the cases the antrum on the affected side was apparently dark on trans-illumination; no note in one case. In no instance was pus present in the nose.

Technique.—As in the radical maxillary antrum operation.

The cyst was opened freely from the month, and the lining membrane removed. The antral cavity itself was opened in all cases, and found to be healthy. A free opening was made into the inferior meatus, and the anterior end of the inferior turbinal was removed.

Findings.—In three cases the cyst was large, and nearly obliterated the antral cavity. In the fourth case the cyst was about the size of an ordinary marble.

Results.—Cure in two cases; two not reported.

d. Ethmoidal Sinus Suppuration.

CASE 1.—Female. Complained of pain over the right cheek, and above the eye. Examination showed pus in the right middle meatus, and œdema of the uncinate process. The frontal sinus was bright on illumination, and proof-puncture of the antrum was negative. The anterior end of the right middle turbinal was removed, and the anterior ethmoidal cells were freely opened. Result not known.

CASE 2.—Male, aged forty-seven. Had suffered from unilateral nasal discharge for twelve weeks following influenza. The frontal sinus and antrum on the affected side were healthy, but the middle turbinal was polypoid, and pus was present in

the middle meatus. Under local anesthesia the left middle turbinal was removed and was found to contain an air-cell full of foul-smelling pus. *Result.* Cured within three months.

CASE 3.—Female, aged fourteen. Had suffered from nasal obstruction, discharge and headaches for several years. Nasal polypi had been removed on eight occasions, and the radical operation had been performed on both maxillary antra. The frontal sinuses were absent as shown by radiograph. Under general anesthesia the right, and later the ethmoidal region, was operated upon by the external route.

The other cases in which the ethmoidal cells were involved (35 in number) are described under the frontal, antral and sphenoidal sinuses.

E. Sphenoidal and Posterior Ethmoidal Sinuses.

Six cases, one of which was bilateral.

CASE 1.—Male, aged fifty-six. Was sent over from the Ophthalmic Department complaining of pain and blindness in the left eye of fourteen days' duration. Six days after the onset of the symptoms proptosis appeared. The patient did not complain of nasal discharge. On examination the inferior and middle turbinal were atrophied on both sides, and pus was present in the olfactory cleft on the left (affected) side. The posterior ethmoidal cells and sphenoidal sinus on the left side were opened under local anesthesia, but, although the mucous membrane appeared thickened, no pus was found. Within a few days the proptosis greatly diminished, and the sight returned to some extent. At the present time (two years after operation) slight proptosis is still present, and there is slight optic atrophy on the left side, but the patient has useful vision in this eye.

CASE 2.—Male, aged eighteen. Complained of a chilly feeling on returning from work three days before admission. Next day he had severe pain in the right eye, which was tender to touch. On the following evening the right eye became swollen and red. On admission the eye was found to be proptosed, and the eyelids bright red and swollen. The eye movements were limited, but the sight was fairly good. Posterior rhinoscopy showed the posterior end of the right middle turbinal to be swollen and surrounded by pus. Under morphine scopolamine anesthesia, aided by the local application of cocaine and adrenalin, the posterior end of the right middle turbinal was removed and the posterior ethmoidal cells and sphenoidal sinus opened; only one or two drops of pus were obtained. One week later the proptosis had almost entirely disappeared, and the sight had greatly improved.

CASE 3.—Female, aged twenty-one. Complained of bilateral nasal discharge and headaches for one year. On examination pus was seen on the posterior ends of both middle turbinals, and on the roof of both choanae. The frontal sinuses illuminated, and, although the antra were dark, proof puncture was negative. The posterior end of the left middle turbinal was removed, and the sphenoidal and posterior ethmoidal sinuses opened. The lining mucous membrane appeared healthy, and accordingly the right side was not interfered with. Unfortunately, the patient has not reported.

CASE 4.—Female, aged eighteen. Complained of nasal discharge and crust-formation of several years' duration. There was also deep-seated pain between the eyes. The patient's sense of smell was lost, but her relations complained of the bad odour of her breath. Examination showed a greenish crust in the left side of the nose and pus in the olfactory cleft. The turbinals were markedly

atrophied. The antra were dark, but on puncture only clear fluid was washed out. The remains of the middle turbinal were removed, and the left posterior ethmoidal cell and sphenoidal sinus opened under chloroform. The lining membrane was seen to be congested, but no pus was evident in the cavities. At the present time there is still crust-formation, but the patient admits that she has neglected the routine treatment for ozæna which she was advised to carry out.

CASE 5.—Female, aged forty-three. Suffered for many years from headaches and deep-seated pain between the eyes. On examination pus was present in the left olfactory cleft, and there was a moderate degree of atrophy of the turbinals with some crust-formation. The left antrum was found to contain pus, and the radical operation was performed. In addition the left sphenoidal sinus was opened, but the lining membrane was apparently healthy. At the present time the patient reports herself as considerably relieved, although there is still some crust-formation and occasionally headache after reading.

CASE 6.—This has already been recorded among those in which the double radical maxillary antrum operation was performed. The sphenoidal sinuses were opened through the maxillary antrum, but the access was bad. Unfortunately the patient has not reported.

REMARKS.

(1) The periodicity of pain in cases of frontal sinus disease is interesting. We know that the inferior turbinals tend to become engorged at night. Is it possible that the middle turbinals are engorged during the time at which severe headache is present in frontal cases?

(2) What are the indications for operation in cases of frontal sinusitis? One of the present writers has been informed that Killian himself is by no means satisfied with the present technique of his operation.

(3) What is the best method for dealing with ethmoidal suppuration? The present writers have no experience of Lack's or Ballenger's methods, and have always adopted those advocated by Hajek at the recent meeting of the British Medical Association.

(4) The value of transillumination is doubtful, and at most this proceeding is only an aid to diagnosis.

(5) With regard to the operations upon the frontal sinus, there seem to be two weak points: (a) The danger of necrosis of the bridge; and (b) narrowing of the opening into the nose, allowing of accumulation of pus in the area behind the bridge.

(6) The writers are by no means satisfied with their technique in intra-nasal operations on the antrum.

(7) The frequency of sphenoidal suppuration? One of the present writers has shown that sphenoidal sinus suppuration is much less common than is usually reported, and that naked-eye examination of the contents of the sphenoidal sinus is not a reliable

guide to the presence of sinusitis (*Edinburgh Medical Journal*, November, 1910).

(8) The present writers would be interested to learn the opinion of the members of the Scottish Society of Otology and Laryngology as to the scarlatiniform rash, which sometimes follows operations on the accessory sinuses. Are these true cases of scarlet fever?

In conclusion we wish to tender our best thanks to Dr. Logan Turner for his kind permission to operate on and record the great majority of the cases which have formed the subject of this paper.

DIFFUSE OSTEOMYELITIS FROM NASAL SINUS SUPPURATION.

BY DAN MCKENZIE, M.D., F.R.C.S.E.,
Surgeon, Central London Throat and Ear Hospital.

(Continued from p. 25.)

Symptoms and Course.

Duration.—Two varieties of cranial osteomyelitis are described by the classical writers; the rapid and the slow. The former, which merits the epithet hyper-acute or fulminating, is common when the osteomyelitis result from pyæmia or some other constitutional disease, and from trauma (non-operative). No case of fulminating nasal sinus osteomyelitis has so far been recorded, although Gerber reports one case following mastoid suppuration. The hyper-acute form lasts only a few days and is rapidly fatal.

Diffuse osteomyelitis from nasal sinus suppuration runs a more leisurely course, and an analysis of the cases as recorded has led me to divide them into two classes:

(1) The acute, with a duration of from three to twelve weeks.

(2) The chronic, with a duration of from six months to two years.

A longer experience of the disease may, and probably will, make us acquainted with cases which occupy a position intermediate between these two grades, but for the present the distinction is clear and the classification adequate.

In the *acute* form the clinical events follow one another closely. The pyrexia is for the most part continuous, although the temperature may fall to sub-febrile, and even, briefly, to normal limits

during short lulls, and the progress of the disease is uninterrupted by any definite intervals of pronounced quiescence.

In the *chronic* form, on the other hand, the disease develops more slowly and its progress is broken. Phases of activity, with pyrexia and abscess formation, alternate with periods of rest when the temperature is normal and local signs sink into insignificance or abeyance. During the intermissions so unruffled may the calm be that the patient and his medical attendant may regard the disease as cured, but, as Sir StClair Thompson has pointed out, the calm is deceptive. Sooner or later a recrudescence sets in, and all the symptoms flare up again.

I have not been able to trace any connection between the rate of progress of the disease and its origin. Spontaneous cases and post-operative cases show, on the whole, no difference in duration.

The numbers at our disposal are scanty, but as far as they go, they tend to support our natural expectation that the prognosis in the chronic should be rather better than in the acute type. Thus, of six chronic cases, four died and two recovered; of the ten acute cases, nine died and one recovered.

Onset.—In spontaneous osteomyelitis, which, as we have seen, arises most frequently in the course of an acute sinusitis, the occurrence of the bone disease may be unsuspected until the sinus is opened surgically. This is specially so when, the sinus wall having broken down, swelling and inflammation of the soft parts are present. The appearance of an cedematous swelling at some distance from the sinus should, however, be regarded with suspicion. The onset of the grave complication is usually heralded by a rise in the temperature to a level higher than its previous readings.

In post-operative cases the onset of the disease is even more gradual and insidious. Not infrequently the skin-wound will have united, the temperature be normal, and the case seem to be progressing to a smooth recovery, when a little superficial swelling and redness, like that of a stitch-abscess, appears in a limited part of the external wound (Durand's and my cases). This may be opened by the surgeon, but the relief is not followed by healing. On the contrary, the tumefaction slowly extends, the edges of the wound gradually separate, and the discharge of pus becomes more and more plentiful. Pain usually accompanies the inflammation, and is sometimes severe; some patients, however, experience only a little discomfort, and have no real pain.

So far, there is little in the appearance of the parts to distinguish the case from one of simple re-infection of the wound area.

But the slowness of development contrasts with the smart reaction that follows re-infection. Moreover, the character of the swelling in and around the open wound should awaken suspicion. It is pale, puffy, œdematous, and merges imperceptibly into the surrounding tissues. There is only a slight amount of redness in and around the edges of the incision, and the skin elsewhere over the swelling shows little or no change from the normal colour.

At this stage, if the sinus be opened up again and examined by the surgeon, the bone which was exposed in the original operation may at once attract attention by its dead-white or discoloured appearance, and if a piece be removed with cutting forceps pus may be seen to ooze from the cut edges.

Along with these indications of local disturbance, the patient begins to show signs of toxic absorption in pyrexia, headache and general malaise: asthenia, restlessness, anorexia and anæmia—symptoms of a toxæmia which becomes more and more profound if the course of the disease is uninterrupted, deepens and lightens if it waxes and wanes, and disappears altogether if the local disturbance permanently subsides.

Sooner or later the appearance of an œdematous swelling in the soft parts at some distance from the sinus of origin testifies to the extension of the disease in the diploë. It is characteristic of osteomyelitis that the pericranial abscesses which induce these swellings in the forehead, hairy scalp, or temporal region, are discrete and separated from each other by areas of seemingly healthy, if œdematous, tissue, their confluence being prevented by the giving way of the pericranium, which we remarked in the pathological section. The disease burrows like a mole in the earth, and, like a mole, throws up mounds here and there as it goes along.

The abscess formation accompanies the disease in its extension from one bone to another, and, as the infective process may travel downwards as well as upwards, the bridge of the nose and the eyelids also become swollen and œdematous from pus collecting in these regions.

The temperature undergoes a slow rise from the normal to a moderate continued fever. Rigors, save in pyæmic cases, are unusual. Terminal hyperpyrexia may appear.

The course and development of the disease can often be considerably modified by surgical interference. The opening of external abscesses as they form, the resection of the necrosed tables of the skull and the evacuation of extra-dural collections of pus not infrequently bring the progress of the disease to a stand-

still, in a few cases permanent, in most cases only temporary. After an interval of weeks, or even of months, the slow swelling usually reappears, and the disease takes another step forward. Again the surgeon will operate and bring the process to a term, and again, after a pause, recurrence will take place. With each attack, however, the intervals become shorter, the local and constitutional symptoms more severe. Pain, if present, becomes more and more intolerable until the septic absorption renders the patient dull, torpid, and finally comatose. Death ensues from toxæmia, asthenia, pyæmia, or some intra-cranial complication.

As we have already remarked, the complete absence of symptoms during the intervals between the attacks may deceive us into thinking that the disease has been cured. Caution, therefore, is necessary, and a considerable period—according to Sir StClair Thomson at least five months—should elapse before we release the patient from control.

In the cases which recover, when the dead bone has exfoliated or has been removed, the soft parts, which may have been freely opened up, unite again and cover over the gaps in the skull. (The comparative indifference of the soft tissues to the infection is remarkable. I have seen an incision in the soft parts unite even when the underlying necrosed bone was still *in situ*.) Convalescence, apart from the healing of the wounds and the re-formation of bone, does not seem to be unduly protracted.

In the acute form of the disease the appearance of the symptoms follows the general lines we have just laid down, the only difference being that the quiet afebrile intervals are either altogether omitted or are represented merely by a remission of the symptoms, more or less marked.

Intra-cranial complications.—As we have seen, the intervention of an intra-cranial complication may cut short the disease at any stage in its development. The complications liable to occur are: (a) *Extra-dural abscess*, which, being practically invariable (it was absent only in two cases, Claoué's and my own), is not really an accidental complication but a regular feature of the disease; (b) *thrombo-phlebitis of the intra-cranial venous sinuses*; (c) *cerebral abscess*; (d) *leptomeningitis*.

Extra-dural abscess, if moderate in size, may be latent so far as nerve disturbance is concerned. If a considerable quantity of pus collects, however, focal symptoms from pressure upon the cerebral cortex may make their appearance. Thus, in one of Luc's cases pressure upon the Rolandic area induced contra-lateral hemiplegia.

Signs of increased intra-cranial pressure may also set in, simulating true cerebral abscess, but distinguishable from it when drainage of the extra-dural collection is followed by a disappearance of these signs. We may suitably mention here that changes in the optic disc are frequent in the later stages of cranial osteomyelitis.

Intra-cranial thrombo-phlebitis produces its usual symptoms, varying according to the vessel affected. It generally leads to death from toxæmia or pyæmia. In Wylie's case extensive sinus thrombosis and suppuration developed without giving rise to collateral meningitis.

Cerebral abscess, usually of the frontal or parietal lobe, and lepto-meningitis require no special description.

Summary.—The whole clinical picture is that of a low and chronic but progressive septic infection, characterised by tardy and imperfect tissue reaction, attacking the bone of a region anatomically open to fatal secondary complications, and inducing toxæmia and septicæmia more often than pyæmia.

The periodicity of the symptoms, which characterises even the acute form of the disease, is highly suggestive of oscillating defensive powers, and thus tends to support the ætiological theory of a relatively heightened microbial virulence.

Diagnosis.

The sure and certain sign of diffuse osteomyelitis, a sign which serves to distinguish it from simple septic inflammation of the operation wound and from simple peri-sinus abscess, is the appearance of an œdematous swelling over the bone some distance away from the affected sinus.

Syphilitic disease of the frontal bone may be mistaken for osteomyelitis, and should purulent frontal sinusitis accompany the gummatous disease in the bone (as in Seanes Spicer's case; see appendix), a correct diagnosis may be a matter of considerable difficulty. If pyrexia is absent, the difficulty would be less likely to arise. Moreover, the diploë in the neighbourhood of the sinus, though it will be converted into granulation-tissue, will not contain pus.

Osteomyelitis of the superior maxilla in children may be mistaken for simple antrum suppuration. (Brown-Kelly.)

Prognosis.

What has gone before renders unnecessary any further insist-

ence upon the evil prognosis of diffuse cranial osteomyelitis. Spontaneous cure can scarcely be hoped for, and all the cases which have hitherto recovered undoubtedly owe their escape to prompt surgical intervention.

We have already commented upon the great contrast shown in the records between the chances of recovery in diffuse spontaneous osteomyelitis as compared with diffuse post-operative osteomyelitis. Even under modern surgical treatment a successful result in the latter class has not yet been reported as far as I can discover. It is possible, however, that early diagnosis and immediate intervention may, in the future, render the outlook even in these cases less gloomy than it is at present.

(To be continued.)

SOCIETIES' PROCEEDINGS.

BRITISH MEDICAL ASSOCIATION.

Meeting at Liverpool, 1912.

SECTION OF LARYNGOLOGY AND RHINOLOGY.

JOHN MIDDLEMASS HUNT, M.B., *President.*

Abstract Report by MR. HAROLD KISCH.

(Continued from p. 39.)

Discussion on the Treatment of Chronic Suppurative Ethmoiditis.

OPENING PAPER BY **Prof. L. Hajek**—*continued.*

II.

We come now to the problem of chronic ethmoiditis, where the suppuration predominates in the clinical picture. Here we must at once differentiate between the (1) open and the (2) closed empyema, because the treatment is different in both kinds.

(1) *Open Suppuration of the Ethmoid.*—Here we must, first of all, be guided by the diagnosis. I should like to say that the procedures required for an exact diagnosis form at the same time an important part of treatment. In order to fulfil the requirements, one has to remove all visible polypi and hypertrophied parts of the interior of the nose. Also the middle turbinate must be sacrificed mostly, because it is partly degenerated, and partly occludes the free view of the ethmoid labyrinth. At times the middle turbinate can be saved, and we should aim at saving this organ, for it possesses a functioning cavernous body. Only after making free the middle meatus we are able to state whether an ethmoid suppuration is present alone or in combination with affections of other sinuses. Also the extent of the suppuration of the labyrinth can be recognised only after obtaining free access to the middle meatus and repeated use of the probe.

Let us suppose, for instance, we have to deal with an open suppuration of the anterior ethmoid cells—that is, those opening into the middle meatus—and that we have succeeded in finding out that the pus comes out on the roof of the middle meatus, between the bulla and the insertion of the middle turbinate—that is, one of the typical openings of the ethmoid cells. The curved probe goes about 1 cm. laterally towards the lamina papyracea. We then open the ethmoid from the roof of the middle meatus through this ostium ethmoidale. It is most convenient to use for this purpose my ethmoid hook to break down the bony walls around the ostium and then to enlarge the cavity by means of the ethmoid curettes mentioned before, biting away the surrounding bone. If the disease has advanced further into the ethmoid, one can open the way into the diseased cells, remove their walls, and in a few minutes one can see nearly every point, control it with the probe and get an excellent orientation regarding all details.

In other cases the main suppuration is localised in the infundibular cells. The entire mucous lining of the hiatus semilunaris of the infundibulum and of the cells opening into the latter is diseased. In such cases the best plan is to resect first of all the processus uncinatus, beginning at its anterior end at the attachment to the agger nasi. A free access to numerous infundibular cells is obtained by a resection of a part of the bulla. It must be emphasised that the endo-nasal removal of the infundibular cells requires great caution. The variable anatomic conditions postulate restriction, for the orbit is endangered if one goes too far laterally, and if the infundibular cells reach high up the roof of the ethmoid, the lamina cribrosa may be injured. Therefore, if infundibular cells reach high up, the extra-nasal route is indicated. But with the exception of the rare cases of infundibular cells reaching high up, all other parts of ethmoid labyrinth can be removed by the endo-nasal route.

In suppuration of the posterior ethmoid labyrinth we can act in a twofold way: Either we begin with the operative removal of the anterior labyrinth, and then by gradual progression we enter the posterior part if the anterior and posterior labyrinth are diseased; or we open only the posterior labyrinth if the anterior is healthy. The preferable place for opening the posterior labyrinth is situated just above the line of attachment of the middle turbinate in the upper meatus (Hajek (2)). Here my ethmoid hook can easily be applied, and will open by pulling it in a forward, inward, and downward direction the posterior ethmoid labyrinth safely. If a part of the anterior labyrinth is also opened by this procedure it does not matter much, for sometimes it must be done in any case for better orientation. The removal of the walls of the posterior labyrinth up to the anterior wall of the sphenoid sinus offers but little technical difficulty. Owing to the depth of the ethmoid labyrinth at this point an injury of the orbit is not at all likely, but one must be on the look-out for it when working on the infundibular cells in the hiatus. Such injuries of the orbit have been observed already repeatedly, and I have seen them, too, several times, but luckily without any further harm.

An important question is that dealing with the intervals between the operative sittings. One should never operate until all the reaction caused by the previous operation has subsided. If we operate before the reaction has subsided, then the next reaction is more intensive; furthermore, after an operation on the ethmoid also the healthy parts of this region are swollen and can appear like polyps, which, however, return to the normal

state after a few days. This makes the differentiation between healthy and diseased parts much more difficult, sometimes even impossible.

In breaking-down suppurating ethmoid cells it is important that the opening be a large one. If this is insufficient the reactive swelling may cause retention of the secretion, with a rise of temperature and threatening symptoms. I have published a case (Hajek (19)) in which the condition was extraordinarily obstinate, so that the operation, done by one of my assistants, was insufficient. We lost this patient through meningitis, caused by violent reaction and retention of secretion. If we are in doubt whether we shall be able to obtain sufficient drainage for the pus, then it is better not to operate endo-nasally, but to use the external route under general anaesthesia. The aim of after-treatment is, indeed, to prevent all retention. Therefore packing should not be used. If this is not possible the packing should be removed as early as possible, or at least it should be applied as loosely as can be. The healing or scarring of the mucous membranes of this region takes weeks, if not months. It is a good plan to soften the crusts, as long as after-treatment lasts, by means of oil and ointments. Sometimes it becomes necessary to promote healing a little with silver nitrate where the granulations on the edges of the injured bone threaten to become too exuberant.

(2) *Extra-nasal Method.*—The extra-nasal method is indicated:

(i) In suppurative ethmoid disease, when the endo-nasal method was not sufficient owing to the inaccessibility of the infundibular cells, also orbital cells, reaching up very high.

(ii) Where the accessibility to the ethmoid is restricted owing to a narrow nose, and where threatening symptoms do not permit waiting until sufficient space is obtained by an operation for the anomaly of the septum.

(iii) In ethmoid suppuration when complicated with marked disease of the frontal sinus.

(iv) In ethmoid suppuration when the endo-nasal method could not ward off a threatening bursting of the suppuration into the orbit, or when bursting has taken place already with formation of abscess.

Kuhnt and Grünwald lay open the ethmoid labyrinth by an incision through the skin; Jansen has forced his way into the ethmoid labyrinth through the maxillary sinus.

The incision devised by Killian (23), with resection of the frontal process, is the best for most cases. Of course, in cases of formation of a fistula or abscess one does not always adhere to the typical operation, but has to regard the individual requirements of the case. Especially in cases of abscess-formation all cosmetic considerations must be put aside; one must abstain from primary suture, and even the orbital bridge cannot be saved. In extensive abscess in the orbit, especially in retro-bulbary abscess, the access to the region one wants to operate cannot be large enough; one cannot pay attention to save the attachment of the trochlea; even parts of the lamina papyracea must be removed if they are necrotic.

Ethmoidectomy, recommended by Guiset (25), will be hardly ever the typical operation in indicated cases of abscess alone, but *de facto* will approach it the more the lamina papyracea has to be sacrificed.

Even the radical methods do not guarantee a healing without recurrence. Also after the radical operation it will be necessary, just as after the endo-nasal method, to control the case for weeks, months or years for the sake of removing now and then remaining or newly formed polypi.

After operations of the ethmoid labyrinth fatal brain complications

have occurred. Dreyfus (26) and Gerber (27) have compiled these cases.

(3) *Closed Empyemata*.—At times after evulsion of a polypus situated high up pus wells up. The evulsion was succeeded by the diagnosis of the empyema, hitherto latent. Similar conditions prevail as regards the majority of circumscribed or diffuse dilatation of the ethmoid labyrinth. For instance, in the region of the middle turbinate or the middle meatus one sees a more or less marked bony enlargement, or tumour, the exact origin of which cannot be stated *à priori*. It can be either an enlarged middle turbinate or an ethmoid cell dilated by mucus or pus, or a bulla ethmoidalis dilated by pathological contents, or the process uncinatus enlarged by the same cause. The probe tells us that all these formations are cystic cavities with bony walls. Exact palpation shows a more or less distinct fluctuation here and there, which demands the opening of the cyst in that place.

The endo-nasal opening of the closed ethmoid empyema is nearly always sufficient to effect a complete drainage. External opening is mostly not necessary, except that an extension into the orbit and abscess-formation call for it urgently. The symptoms of dislocation of the bulbous which occurs in consequence of a closed empyema disappear generally in a short time.

III.

The chronic suppurative inflammations of the ethmoid which appear under the symptoms of ozena require a separate discussion. The suppurative inflammation of the ethmoid bone must be treated on the same lines as the hyperplastic inflammation of the ethmoid bone, but the indications for their operative treatment must be very much restricted in ozena, as the therapeutic gain is mostly quite insignificant. According to my experience, only those cases of ozæna with chronic ethmoiditis should be operated on where the ethmoid labyrinth or part of it is the main source of the suppuration, and where we can therefore hope to improve or stop the bulk of suppuration by a change in the condition of the ethmoid. Only in cases of threatening complications of a closed empyema we may abstain from conservative methods.

REFERENCES.

- (1) UFFENORDE.—“Die Erkrankungen des Siebbeines,” 1907.
- (2) HAJEK.—“Pathologie u. Therapie der entzündlichen Erkrankungen der Nebenhöhlen der Nase,” III Auflage, 1909.
- (3) HAJEK.—“Warum rezidiviren die Nasenpolypen,” Vortrag, 1902. *Wien. med. Presse*, 1902.
- (4) ZUCKERKANDL.—*Normale u. pathologische Anatomie der Nasenhöhle*, Bd. i, ii Auflage, 1893.
- (5) GRÜNWALD.—“Die Lehre von den Nasenerkrankungen,” München, 1893.
- (6) WOAKES.—“Necrosing Ethmoiditis,” *Lancet*, July 18, 1885.
- (7) HAJEK.—“Ein Beitrag zu Rezidive der Nasenpolypen,” *Archiv f. Laryngol.*, Bd. xvii, Heft 3.
- (8) ZUCKERKANDL.—*Normale u. pathologische Anatomie der Nase*, Bd. ii, 1892, I Auflage.
- (9) HAJEK.—“Ueber die pathologischen Veränderungen des Siebbeckknochens im Gefolge der entzündlichen Schleimhauthypertrophien u. der Nasenpolypen,” *Archiv f. Laryngol.*, Bd. iv, Heft 3.
- (10) LAMBERT LACK.—“Laryng. Society of London,” 1901. *Croonian Lect. f. Laryngol.*, 1901.
- (11) SPENCER.—*Ibid.*

- (12) H. TILLEY.—*Ibid.*
- (13) STCLAIR THOMSON.—*Ibid.*
- (14) MARTIN.—*British Medical Journal*, December 24, 1892.
- (15) CORDES.—“Ueber die Hyperplasie, die Polypi, die Degeneration der mittl. Muschel der Nasenpolypen u. ihre Beziehungen zum knöchernen Teile des Siebbeines.” *Archiv f. Laryngol.*, Bd. xi.
- (16) STENGER.—“Zur Technik der endonasalen Siebbeinoperation,” *Zeitschrift für Ohrenheilkunde u. f. d. Krankheiten der Luftwege*, lxiv, Bd. iii u. iv, 1912.
- (17) SCHÄFFER.—“Chirurgische Erfahrungen in der Rhinologie u. Laryngologie,” Wiesbaden, 1885.
- (18) HARTMAN.—“Atlas der Anatomie der Stirnhöhle,” etc., 1900.
- (19) HAJEK.—“Ein Beitrag zum Studium des Infektionsweges bei rhinogenen Gehirnkomplicationen,” *Archiv f. Laryngol.*, 1906, Bd. xviii.
- (20) BOSWORTH.—*Archiv f. Laryngol.*, Bd. iii u. iv.
- (21) KUHNT.—“Die entzündlichen Erkrankungen der Stirnhöhle,” Wiesbaden, 1905.
- (22) JANSEN.—“Berichte des Moskauer Congresses,” 1897.
- (23) KILLIAN.—*Archiv f. Laryngol.*, Bd. i, S. 320.
- (24) RIEDEL.—“Publiziert durch Schenke, Dissertation,” Jena, 1898.
- (25) GUISET.—“Huit cas de trépanation du système sphéno-ethmoïdale par voie orbitaire,” Extrait des “Bulletins et Memoires, Congrès de 1906, Paris.”
- (26) DREYFUSS.—“Die Krankheiten des Gehirnes und seiner Adnexa im Gefolge von Nasenerweiterungen,” Jena, 1896.
- (27) GERBEK.—“Die Komplikationen der Stirnhöhlenentzündungen,” 1909, Verlag von S. Karger.

(To be continued.)

ROYAL SOCIETY OF MEDICINE.—OTOLOGICAL SECTION.

November 15, 1912.

DR. J. DUNDAS GRANT, *President of the Section, in the Chair.*

Two Cases of Vertigo in which the Blood-pressure was very low and Reactionary Vertigo was excessive after rotation.—Richard Lake, F.R.C.S., and A. Ferguson Penny, F.R.C.S.I.—The main feature in both cases was the association of vertigo of a severe type with an exceedingly low blood-pressure. In the second case the attacks of vertigo were so frequent as totally to incapacitate the patient. Even a slight movement of the head to one side or the other was sufficient to provoke an attack, which, in every instance, was accompanied with a feeling of nausea. The administration of ernutin with the object of raising the blood-pressure proved satisfactory in both cases. The first case was noted, and treated with ernutin, before we had seen Dr. Byrne's book, and although we had every reason to be satisfied with the action of that remedy in this particular case, we commenced the treatment of the second case with strychnine and atropine. After four days' treatment she reported that she was considerably worse, and she was then given ernutin. Her condition improved markedly and rapidly as the result of the exhibition of this remedy.

Case 1.—Male, aged fifty-five, but looked considerably older. Slight deafness on both sides, which began twenty years ago, and tinnitus also, most marked in the right ear, but not severe. Never any discharge, and

beyond a slight retraction, nothing abnormal in his drum membranes. He had for some years suffered from attacks of giddiness, which, of late, were increasing in frequency. During these attacks he noticed that, as a rule, objects moved from the left to the right. He staggered at times, and found considerable difficulty in walking straight. He appeared to be a neurotic subject. On rotating him for the usual ten times in twenty seconds he got most intense vertigo, accompanied by vomiting, and on each occasion he shot out of the chair, falling over to one side in a state of considerable collapse. A similar severe attack of vertigo followed the cold caloric test. Blood-pressure exceedingly low; after rotation it was only 105. He was treated with half-drachm doses of ernutin thrice daily, with the object of raising his blood-pressure. Since this treatment was adopted he has had no further attacks of vertigo. The doses were gradually reduced, and on April 4 he was reported well.

Case 2.—Female, aged forty-nine, first seen March 8, 1912. Deafness began eight years ago in both ears, accompanied with tinnitus, the latter worse on the right side. Never any discharge. She had paracensis Willisii. First attack of vertigo three years ago. The attacks increased in frequency, and when she came to the hospital she could not walk straight unless she fixed her eyes on the object she was approaching. Any deviation of the head or eyes to the right or left immediately brought on vertigo, with a tendency to fall to the side of the deviation, the tendency in most instances, however, being to fall to the right. The vertigo was accompanied by a nausea, objects appearing to move in a horizontal plane from right to left. Turning over in bed produced the same phenomena. She complained of pain in the occipital region, spreading to the side of the neck and chest. She has double cataract.

May 2, 1910: Patient can walk straight only when the head is fixed. Turning the head or body produces vertigo and nausea, with movements of objects from right to left and a tendency to fall to the right if the movement is towards the right, and towards the left if the movement is towards the left.

April 17, 1912: Rotation ten times in twenty seconds resulted in an excessive reaction, *i. e.* excessive vertigo, nausea and nystagmus, whichever way she was turned. The patient had to be supported, as otherwise she would have fallen to the side of rotation. Blood-pressure: After rotation clockwise the blood-pressure was 95; after rotation counter-clockwise the blood-pressure was 105. Irrigation, with cold water in each ear, gave slight nystagmus only. On May 16 the patient was put on strychnine and atropine (liq. strych. 5 minims, liq. atrop. 1 minim). On May 20 patient reported that the mixture made her worse. Her condition was as follows: (1) The tinnitus in both ears worse; but she did not notice any increase in deafness. (2) Her hands get cold and white, and her fingers swell. She has pains in her arms, hands and occiput. (3) Stooping with the head down produces an immediate attack of vertigo and nausea, but sitting upright relieves both, and leaning with the head back increases both. A strong light on her eyes also causes an attack. On dull, cloudy days she finds that she does not suffer so much from vertigo. A loud noise brings on an attack. Blowing the nose forcibly relieves the vertigo and nausea. To-day (June 20) the strychnine and atropine mixture was discontinued, and she was put on ernutin, $\frac{1}{2}$ dr. *t.d.s.* After taking ernutin for two days only she reported as follows: (1) She is much less giddy and can walk more steadily. (2) She perceived a marked difference after she had taken three doses of the ernutin, and found she could walk without staggering or vertigo.

On testing her with rapid side-to-side movements of the head only slight vertigo and slight feelings of nausea resulted—in marked contrast to the intense vertigo and nausea produced before by this movement. Bending down with the head between the knees and then raising the head into the upright position was not productive of vertigo and nausea. This movement previously produced the most intense form of nausea and vertigo. July 4: Improving rapidly. Can walk comfortably without staggering. Rapid side-to-side movements of head produced only very slight vertigo and nausea. Same result from lowering head and raising it to upright position. July 11: Last week she had no ernutin, and to-day she reports that the nausea, vertigo and staggering are much worse. July 18: Much better again since taking the ernutin. August 22: Can walk without staggering. Has not had an attack of vertigo for three weeks. September 26: No vertigo for five weeks. Patient's nervous system was examined by Dr. Grainger Stuart, who reported that there was no nerve disease.

Mr. LAKE added that the suggestion regarding ernutin came from Mr. Penny.

Mr. C. E. WEST asked what the blood-pressure stood at before the rotation in Case 1, and whether the patient was nauseated in any way?

Dr. MILLIGAN thought the exhibitors were to be congratulated on the results, but could any explanation be given of why the blood-pressure was so low? Was there anything wrong with the capillary system, or was there any vasomotor disturbance?

The PRESIDENT (Dr. J. DUNDAS GRANT) asked what the tuning-fork tests indicated in regard to the localisation of the trouble, and the nature of the change which caused the dulness of the hearing. These cases of low pulse-tension were probably of the same class as those to which Dr. Randall, of Philadelphia, drew attention at the meeting of the International Congress, and in which he had administered adrenalin or powdered supra-renal gland. This no doubt raised the blood-pressure, and acted somewhat in the same way as ernutin.

Dr. H. J. DAVIS referred, in this connection, to his own case. After reading the notes of this case, he had given his patient $\frac{1}{2}$ dr. of ernutin three times a day. This was four days ago, and the patient had not had an attack since. He had not ascertained the blood-pressure, but nothing he had previously given her did good.¹

Dr. DAN MCKENZIE said it was well known that any considerable alteration of blood-pressure caused vertigo, and if one gave adrenalin in a case of high blood-pressure the result might be disastrous.

Mr. LAKE replied that he did not remember that there had been any nausea. He had never tried adrenalin in these cases; he believed it lowered the blood-pressure, except for a short time.

Mr. PENNY replied that it was difficult to determine what was the cause of the low blood-pressure. The effect of the ernutin was most marked, especially in the second case. After taking the drug there was a definite rise in the blood-pressure.

Aberrant Carotids.—Richard Lake, F.R.C.S.—A woman, aged sixty. On each side of the lateral wall of the pharynx a pulsating vessel is visible. The exhibitor is of opinion that these are the internal carotid arteries.

¹ November 27: The patient has had one attack of vertigo in three weeks since taking ernutin.—H. J. D.

Dr. H. J. DAVIS said that a well-known specialist in Chicago had lately described to him how he had opened an unsuspected aneurysm of the internal carotid. He tied it, and the patient eventually was not much the worse.

Dr. ROBERT WOODS said that during the last two months he had seen such a case as Dr. Davis mentioned. It was that of a married woman who had all the appearance of having a supratonsillar abscess. Her doctor, recognising that there was something unusual about it, made a cautious incision with a fine tenotome, and was met with a very forcible spout of blood. No further trouble ensued. The condition was one of aneurysm, for which the common carotid was successfully tied; on the other side the carotid artery was normal.

Mr. JENKINS said there was a complete account of such aberrant internal carotids in anatomical works; it was said to be more common in old age than in young people. Sometimes aberrant internal carotids went downwards and forwards in relation to the lateral wall of the pharynx in young subjects.

Dr. MILLIGAN questioned whether the aberrant artery was not the ascending pharyngeal. In every operation for the removal of adenoids he taught his students to examine carefully the posterior pharyngeal wall for tortuous vessels.

Dr. SALISBURY related an experience in the practice of a Leeds surgeon similar to that spoken of by Dr. Davis. There was an aneurysm of the carotid, which vessel was out of place, and there was a peri-tonsillar abscess in front of the aneurysm.

Dr. WATSON-WILLIAMS said it had been found that such abnormal large pulsating vessels on the posterior pharyngeal wall proved to be the ascending pharyngeal artery, though usually they were internal carotid arteries. They were more frequent than generally believed, but he had continually urged that as a matter of routine before the adenoid operation the operator should look at the back of the pharynx to make sure there were no aberrant vessels. In that way a possible disaster would be avoided: nevertheless, it seemed likely that fortunately, when the operation for adenoids was done in the usual routine way, such vessels might escape.

Mr. LAKE, in reply, said that the first case of the kind he knew was recorded by Dr. Brown Kelly in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

A Method of making a Periosteo-meatal Flap in the Radical and Modified Radical Mastoid Operations.—Hugh E. Jones.

Hitherto all the flaps described for these operations have involved severing the periosteum at the meatal margin, while the cutaneous flap retained a base attached to the conchal skin. One objection to a flap of this kind is that the soft parts of the meatus have to be crushed and dragged forwards and outwards during the operation; and another, that some of the periosteum is usually lost. In the method about to be described the skin-flap is completely severed from the surrounding skin, but retains its attachment to the periosteum, which is reflected upwards and backwards through the post-aural incision, to be replaced, on the completion of the bone operation, on the posterior wall of the bone cavity.

The steps of the operation are, briefly: (1) Make an incision through skin in the hair line behind the ear, curving upwards opposite the highest point of the ear into the scalp for about $\frac{1}{2}$ in. (Ballance's incision) (Fig. 1, s s'). (2) Reflect the auricle forwards until the meatal edge can be

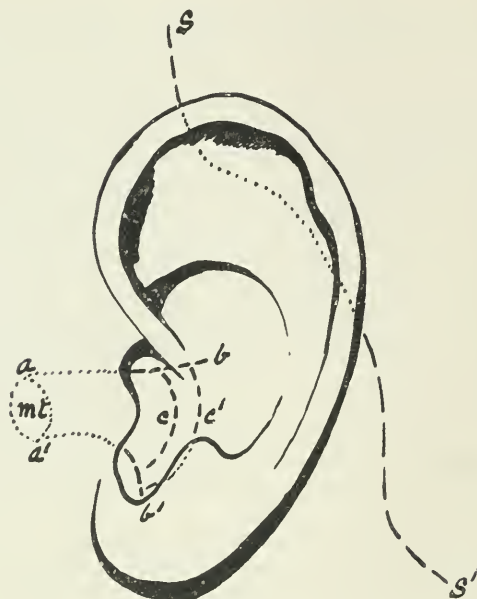


FIG. 1.

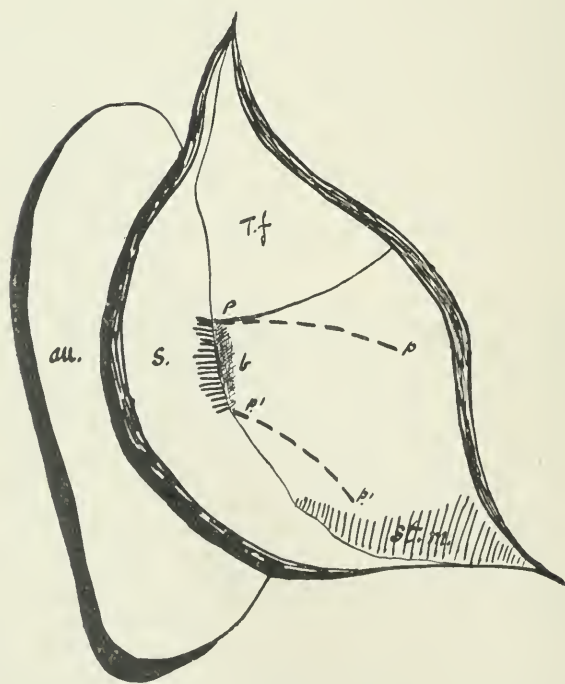


FIG. 2.

defined, leaving the periosteum and meatus uninjured (Fig. 2, *b*). (3) Make two nearly parallel curved incisions through the periosteum from the upper and lower margins respectively of the meatus nearly to the posterior border of the mastoid bone (Fig. 2, *p p*, *p' p'*). (4) Separate the outlined periosteal flap from the outer surface of the mastoid and well into the osseous meatus. (5) Replace the auricle, and make two incisions through the soft parts of the meatus from the tympanic ring outwards—one at the highest, and the other at the lowest, point of the meatus (Fig. 1, *a b*, *a' b'*). (6) Cut through the base of the posterior meatal flap at the point in or near the conchal margin, which is judged to give a sufficiently enlarged meatus (Fig. 1, *c* or *c'*, *c* preferred). (7) A few

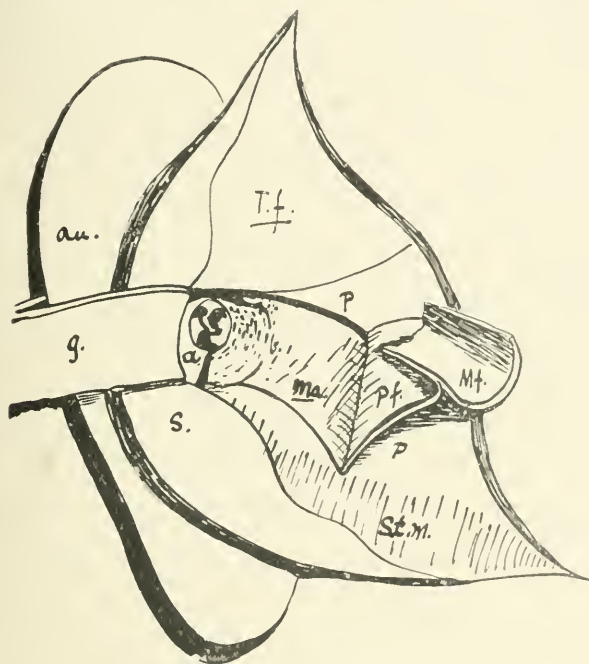


FIG. 3.

touches with the scissors or scalpel will now enable the operator to lift out the posterior wall of the membranous and cartilaginous meatus and the periosteal flap, in one piece (Fig. 3, *Pf*, *Mf*). The combined flap is turned backwards and protected by gauze until the bone operation is completed. Finally, pass a strip of gauze, linen or india-rubber of suitable width through the posterior meatal incision, and hold forward the auricle and post-aural skin-flap (Fig. 3). By this method, as soon as the flap is completed and the hæmorrhage arrested, an excellent view of the meatus is obtained, and, if this is free from granulations and *débris*, of the membrana tympana or the tympanum itself. The meatal tissues do not suffer during the operation, and the anterior half is undisturbed. The flap retains the whole of the periosteum, and helps to fill up the bone cavity. The skin surface has more growing edges than the ordinary flap, and should therefore give greater assistance in epithelialising the cavity. The method is applicable to all *primary* radical or modified radical

mastoid operations, but is obviously not suitable for cases in which there has been extensive separation of the periosteum and an external fistula. Where subsequent secondary operations extending intra-cranially are likely to be required, the flap described would not cause any serious inconvenience, but is not recommended. Where it is desirable to remove the mastoid cortex down to the tip, the lower periosteal incision should curve sharply downwards near the anterior border of the mastoid process.

The PRESIDENT said that Mr. Jones had described what was to him a novel form of plastic flap. He presumed there was sufficient nutrition for the comparatively thicker skin from the thinner periosteum. He asked if Mr. Jones had observed any sloughing of tissue in the flap afterwards.

Mr. HEATH said that the fact that Mr. Jones had brought this flap to the notice of the Section showed that he had not been satisfied with the flaps which had previously been in vogue. With regard to the utilisation of the whole of the posterior half of the cartilaginous meatus as the covering of the cavity, he had utilised it, separate from the pericranium, for five or six years, and did so in acute and chronic cases, and in conservative and radical operations. With regard to the pericranial flap, he had used a shorter one than that described by Mr. Jones, because he made his incision so much nearer the ear. He had used the meatal flap for twelve years, and the pericranial one for six years. The advantage of having them thus separate was, that if there was too much of one flap they could be more or less overlapped, and thus it did not matter much, as he always stitched them together. He found the method so satisfactory that he saw no reason to change it. His own skin incision was made immediately behind the ear, and therefore the pericranial flap was necessarily much shorter than the one now advocated by Mr. Jones. With regard to the advantage of having the whole meatus visible during the operation, he was not sure it was an advantage; he preferred to have the tympanic parts protected by a retractor which pressed against the posterior wall of the meatus, deep in, so that there was no chance of an instrument reaching the drum-head by accident. The removal of the posterior half of the cartilaginous meatus enabled the surgeon to see the tympanic area, and for that reason he had temporarily removed it in every case for six years. He had abandoned Schwartz's operation for that number of years. The great point about having a single meatal flap was, that it could be put at the back of the antral cavity, out of the way. Because if one turned a piece up it swelled and hid the antrum, and if turned down swelled and hid the tympanum, and it is desirable that those parts should be visible during the after-treatment.

Mr. C. A. BALLANCE remarked that ever since otologists made a flap of the membranous meatus, the otologist had dealt with the posterior wall of the membranous meatus. One knew many methods of dealing with the posterior wall of the membranous meatus, and Mr. Jones had now brought forward a new method, which he (Mr. Ballance) believed would develop into an admirable one. He felt immensely indebted to Mr. Jones for having introduced it, and he intended to try it himself.

Mr. BADGEROW regarded the method as a very good one, and said he had used practically the same flap, except for the skin incision. Mr. Jones went back into the hair, and then made a periosteal flap; he had seen Mr. Heath when at Golden Square use practically the same meatal and pericranial flap in all his cases for the last six years.

Dr. WATSON-WILLIAMS said he gathered that one new feature in this

very promising and suggestive flap was, that the posterior meatal wall skin-flap was completely detached from the skin all round, and that "the one string to its bow" was its attachment to periosteum. He did not gather that other flaps just referred to by Mr. Heath and Mr. Badgerow were thus completely isolated, and as far as he could understand their remarks, Mr. Hugh Jones's flap was quite a different thing.

Mr. HUGH JONES replied that until the day before he did not know Mr. Heath made a periosteal flap, but he now saw that the periosteal part of Mr. Heath's flap was something like what he had himself now described. But in the flap demonstrated the meatal skin and periosteum remained unseparated; the essential difference was that, in the method now described, the periosteal-meatal flap was cut in one piece at the beginning of the operation, so as to give a clear view of the osseous meatus and tympanum. The nourishment of the flap was the one fear he had. He had not seen the nourishment fail, but he had not yet had occasion to reopen a case in which the operation had been done, so that he could not say exactly what happened to the flap eventually. It was as yet experimental, but he thought he would like to bring it forward at once, so that other surgeons might try it. He himself employed the method twelve or fifteen times, and thought it was "all right."

Thrombosis of Jugular Bulb; Ligation; Empyema; Recovery.

—C. Ernest West, F.R.C.S.—Female, aged twenty. Left otorrhea for three weeks, pain behind ear five days, swelling four days. No history of sickness or giddiness. Doubtful history of two rigors on day of admission. Headache; no pain in neck. Admitted on June 3, 1912. Temperature on admission 102.4 F.; pulse 108; respiration 24. The posterior wall of the meatus was prolapsed, obscuring the view of the membrane. Edema and redness, but no fluctuation over the mastoid. Great tenderness, especially towards tip of process. Glands along jugular not felt to be enlarged. Pupils equal; no nystagmus. A Schwartze operation was carried out immediately. The lateral sinus was exposed in the course of the operation and appeared normal. A Bezold's perforation had taken place through the tip of the mastoid. Temperature subsequently remained of an oscillating type with a rigor on two occasions. Second operation (June 13): The sinus was examined and found healthy in the exposed portion. On following it downwards the jugular bulb was found thrombosed and its wall necrosed. The vein was tied in the neck and the bulb cleared out. Subsequent history: Great improvement for three weeks as regards temperature, but failure to improve in general condition; then renewed rise of temperature. After two explorations empyema found low down on left side: opened and drained (1½ pints). This was followed by some subdiaphragmatic peritonitis. Final complete recovery. Bacteriology: From the jugular bulb were grown streptococci and a Gram-negative bacillus. From the empyema were grown streptococci and a diphtheroid organism.

Injury to Internal Carotid Artery in Curetting Tympanic Part of Eustachian Tube.—C. Ernest West, F.R.C.S.—Female. Chronic suppurative otitis media, right. Radical mastoid operation (July 9, 1912): Upper part of Eustachian tube curetted out. In finally withdrawing curette, injury to internal carotid. Hæmorrhage controlled by digital pressure in neck. Immediate ligation of common carotid. No further hæmorrhage. Uninterrupted recovery.

Mr. WEST had reported the first case because it had several points of rarity; it was a case of thrombosis in a recent otitis media; the thrombosis was primary in the jugular bulb, and the patient recovered after a serious pyæmic complication in the thorax. It was the first case which he had had in which the patient got finally well after such invasion of the lung and pleura. In the second case he did not know why the carotid was injured; he was not using any undue violence or pressure in curetting the tube, and he supposed that there had been a hiatus in its inner wall. There had been no apparent ill-effects from the unfortunate accident. He believed ligation of the carotid was the only possible treatment of the condition if the patient's life were to be saved. In this case the alarming feature had been, not the total amount of blood lost, but the great violence of the hæmorrhage while it lasted. The patient was in the early twenties, and that might have something to do with the completeness of her recovery.

Dr. MILLIGAN agreed that such cases were rare, but not excessively so in children. He supposed very few members had seen recovery after septic pneumonia or empyema secondary to sinus thrombosis. He did not think so many thrombotic cases were seen nowadays as ten years ago, and the explanation probably was that more attention was now paid to the early treatment of ear disease. He had had a similar misfortune to that detailed in the second case, in a patient aged sixty, the operation being a complete labyrinthectomy. He discussed with the medical man in attendance the various ways of sealing up the Eustachian tube, and remarked how difficult it was to be certain that it had been effectively closed. In this instance he used a burr with the ordinary care. In a moment there was a swish, and the wound was filled with blood. He put his finger into the bottom of the wound, and rapidly plugged it. He packed it very tightly, and in twenty-four hours he gently removed the packing, with the aid of hydrogen peroxide, and again there was severe hæmorrhage. He decided not to tie the carotid, but plugged again, and there was no further hæmorrhage. The force seemed to be too great for it to be venous blood. The patient was fairly deeply under continuous ether anæsthesia. The vessel from which the bleeding came must have been an aberrant one. He asked whether Mr. West could prove that the hæmorrhage in his case was carotid artery bleeding, not from an aberrant jugular bulb.

Mr. HUGH JONES said the only case he had seen in life of primary thrombosis of the bulb was caused by himself in curetting the floor of the tympanum. He had been using chromic acid on account of granulations growing from the floor of the tympanum, and thrombosis of the bulb ensued. The man recovered after ligation of the jugular vein.

Mr. JENKINS asked Mr. West why he tied the common carotid and not the internal. The difficulty of tying the latter was great, but sometimes it was less than tying the external. It was yet early to know whether there had been serious effects from the ligation. Ill-results might ensue six or nine months afterwards.

The PRESIDENT, referring to thrombosis of the jugular bulb, said that years ago Lentert wrote a long paper showing that in children with acute suppuration in the middle ear, if the temperature was high and there was vomiting for a few days, there was some thrombosis of the bulb, usually the parietal form. This might disappear altogether, but Lentert recommended operation.

Mr. WEST replied that he did not of course see that it was the internal carotid which bled, but he could not conceive of the jugular bulb being

where his curette was when the bleeding began, and he had never seen a venous channel approach the fury with which this bled. Further, the bleeding was immediately controlled by pressure over the carotid. The hæmorrhage down the Eustachian tube was very severe, and he could not control it at all by packing the tympanum. There seemed no room to him for doubt that the bleeding came from the carotid. He tied the common carotid because there was inadequate room to get at the internal carotid when two fingers were being employed to compress that vessel. He attempted what he could do most quickly.

Cerebellar Hernia following Cerebellar Abscess.—H. J. Davis, M.B.—Boy, aged eight. At the first operation on May 20, 1912, in addition to an acute mastoid abscess being opened, a large extra-dural abscess in the posterior fossa was dealt with in the usual way. The boy was very ill, but made a good recovery. On June 10, three weeks later, he became sick and drowsy, and developed optic neuritis with nystagmus to the opposite side. I operated on him the same evening and evacuated a large abscess in the right cerebellar lobe, containing 2 oz. of pus. To complicate matters the lateral sinus gave way, and hæmorrhage was not easy to control owing to the amount of bone already removed, and to the protrusion of brain matter. The boy slowly recovered, but the hernia protruded more and more. When pressure was exerted by bandaging, sickness and giddiness followed. The question of shaving off the redundant tissue was entertained, but nothing was done, and the hernia, which was a very large one, has receded, skinned over, and is flush with the head. The boy is quite well. This case is instructive from other points of view:

(1) The jugular vein was never tied. This shows that although a septic clot exists it does not necessarily extend and cause damage, though undoubtedly it must be safer to tie the jugular as an extra precaution.

(2) Did the abscess originate by direct infection along the track of the first exploration into the cerebellum? This was done with a fine knife, and every care taken to prevent infection, but the possibility of this occurring is a very important consideration when pus is spread over the outer surface of the dura mater. It is the practice of the exhibitor not to explore the brain in perisinus suppuration if the brain is pulsating, unless, as in this case, there are other reasons to the contrary. Report of pus organism: (a) Films—a few Gram-positive diphtheroid bacilli; (b) cultures—the same organism grown on serum and agar.

Mr. MOLLISON described the sequel to the case of cerebral hernia which he exhibited at the last meeting.¹ The night following the meeting the boy woke up screaming; he was sick occasionally; two days later optic neuritis was present, while previously an expert had found the discs clear. In consultation, a physician agreed there must be some pus in the cranium, probably in the cerebellum, as abscess in the site of a previous cerebral abscess is rare. Operation: Exploration of cerebellum with a narrow knife revealed nothing, neither internal to nor posterior to the lateral sinus. He covered that site with gauze, and explored the position of the old cerebral hernia; with forceps he penetrated the thick capsule of an abscess, and let out 2 oz. of very fetid and thick pus, which he felt sure had been there weeks. The cavity, which extended forwards into the frontal lobe, was washed out, and a double drainage-tube inserted. Three days later, while being dressed, the boy stopped breathing, but artificial respiration for ten minutes brought him round. Further

¹ JOURN. OF LARYNGOL., RHINOL., AND OTOL.

exploration revealed no further collection of pus, and he was now much better, there was less vomiting, and he was taking food well. Right hemiplegia and aphasia developed, due probably to thrombosis of the left middle cerebral artery, so that, even if he recovered, his position would be very parlous. No doubt this abscess had been present many weeks, and accounted for the hernia. The case showed the importance of the superficial abdominal reflex. Two days before operation the right abdominal reflex was much less than the left, and it disappeared the day of operation. Next morning it was present again, and normal. Another point of interest lies in the fact that though the pus from the abscess flowed over the two exploratory incisions in the cerebellar dura mater no infection followed.

Dr. MILLIGAN said that in such cases the first thing to do was lumbar puncture; it relieved intra-cranial tension, and probably prevented sudden respiratory paralysis, which was common in cerebellar abscess. These herniae sometimes contained fluid, even pus. He had seen a hernia of the same size containing glairy fluid, possibly from broken-down necrotic brain-tissue. It was justifiable to put an aspirator into such herniae. Failing getting anything away, one might keep up continuous lumbar drainage for days, or even weeks. That failing, one could perform a decompression operation.

Mr. JENKINS corroborated what Mr. Mollison said as to the importance of the abdominal reflex. He had a case of meningitis, localised to the left cerebrum, and the right abdominal reflex was totally abolished, the left present.

Dr. DAVIS replied that several times he had perforated the hernia with a Horsley pus-seeker, but nothing came out. The serious feature had been the position of the hernia. He had not used pressure, for when that was done the boy became sick and giddy. [*Addendum.*—Dr. Neumann, of Vienna, asked me to record his and Ruttin's tests in this case. I have done so, and the results are as follows:—(1) Is there any spontaneous nystagmus?—Yes; rotatory to the left. (2) Result of pressure on the hernia?—Rotatory nystagmus to the left is increased. (3) Syringing the diseased ear with cold water?—Yes, nystagmus to the left. (4) During syringing, does pressure on the hernia alter the direction of or the intensity of the nystagmus?—Yes, it increases the intensity of the nystagmus to the left. (5) Syringe the sound side (cold water) for one minute; how long does the nystagmus last?—Horizontal nystagmus to the right for two minutes. (6) Repeat this again on another day; does the pressure on the hernia alter the character of the nystagmus?—Yes, the horizontal nystagmus to the right is arrested by pressure on the hernia. (7) Try Bárány's pointing test with the finger; is there any deviation or not? (a) "Up and down?"—Yes, to the right. (b) "Side to side?"—Accurate. (8) Does pressure on application of ice to the cerebellar prolapse alter the accuracy of the pointing? (a) "Up and down?"—Yes, increases the inaccuracy to the right. (b) "Side to side?"—Accurate, no change. (9) Try the same experiment with both feet? (a) "Up and down?"—Yes, to the right. (b) "Side to side?"—No change.—H. J. D.]

Labyrinthine Vertigo, (?) Auditory Tumour.—H. J. DAVIS, M.B.—A woman, aged thirty-three, was admitted for violent attacks of giddiness, lasting from two to twelve hours. Medically, nothing could be found to account for this, and as symptoms pointed to the labyrinth as the cause I was asked to see her. Briefly, she hears nothing in the

right ear, though she seemed quite unaware of this. The left ear is normal, and when occluded by Bárány's apparatus the patient is quite lost; in other words, the cochlear nerve is functionless, and the vestibular nerve nearly so, for the only reaction obtained is ten minutes after syringing with ice-cold water. There is slow nystagmus on looking to the right and not to the left, as would be expected. The patient says she is quite well but for these attacks, which commenced in a small way two years ago, but the last few months they have been much worse. She was advised that the attacks were "biliousness," and she was told to take no notice of them, but this was not an easy thing to do, for she dropped in the street like a log, and her friends thought she was dead. The exhibitor is of opinion that the disease is due to an implication of the auditory nerve before it enters the internal ear, and that this is probably due to a tumour. Wassermann test negative. *Addendum*.—December 15, 1912: Since this patient has been treated by ermetin (30 minims, thrice daily), as recommended by Mr. Lake, she has had only two attacks of vertigo in five weeks, and the blood-pressure, which was low (118), has been raised to 130 with great and rapid movement.—H. J. D.]

Malignant Polypus of the Ear.—H. J. Davis, M.B.—Man, aged fifty-six, with an aural polypus; six weeks' history. This was snared and removed with a curette. The polypus is malignant; no other signs yet. A microscopical section was exhibited, showing malignant growth, and, as pointed out by Mr. Ballance, resembling scirrhus. *Addendum*.—December 15, 1912: Three days after the patient was exhibited I performed a radical mastoid operation. The middle ear was found to be full of friable growth, which kept bulging into the tympanum as fast as it was removed. It was eventually seen that the roofs of the tympanum had been invaded by the growth, which had extended and implicated the dura mater on the under surface of the temporo-sphenoidal lobe. This was curetted away and so far the patient is quite comfortable and the wound has healed, but the patient has lost his memory and is very irritable, though he is up and about the ward.]

Acute Middle-ear Suppuration; (?) Cavernous Sinus Thrombosis; Recovery.—Dan McKenzie, M.D.—Female, aged eleven, a puny and delicate child. A week previous to my seeing her acute suppuration of the middle ear set in with high temperatures. A few days later proptosis of the right eye was observed. There was some drowsiness, and the patient had vomited once. When I first saw her there was marked protrusion of the right eyeball, chemosis and oedema of the eyelids. The pupil reacted, and there was no evidence of paralysis. Examination of the fundus, made by Dr. Salisbury a few days later, revealed some venous distension. Immediate mastoid operation, radical, in view of the apparently serious intra-cranial disease. Lateral sinus exposed, slit up, and found to be normal. After the operation temperatures ranged between 98° and 101° F. for ten days and then became normal. The eye was less prominent forty-eight hours after operation, and regained its normal appearance in about a week. Some suspicion of oedema was observed in the left eyelid at the operation. The diagnosis of cavernous sinus thrombosis is, of course, problematical. Mild venous infection with thrombosis and recovery occurs elsewhere in the body, even in the lateral sinus, it is said. Thus there is no inherent impossibility in the same series of changes affecting the cavernous sinus.

The PRESIDENT thought the diagnosis more probable than problematical, but it might not have been an infective thrombosis. Still, he thought there was a clot, or at all events some obstruction to the return of blood.

Dr. McKENZIE replied that he had some hesitation in putting that name to it, but aseptic thrombosis of veins occurred elsewhere, and the symptoms were the same as those of cavernous sinus thrombosis. Both ears were the seats of acute suppuration, and there was some doubt as to which ear should be operated upon: but the ear was chosen which was on the same side as the proptosis.

Lens for Use in Mastoid Operations.—**Dan McKenzie, M.D.**—The lens is mounted on a detachable and sterilisable rim and handle. It is useful in examining the outer labyrinth wall.

Mr. HUGH JONES said he used a pair of + 5' lenses (cut from one large lens) fitted on to a head-lamp frame, which he found very handy. The frame was an open one, like a trial-frame, and other lenses of different strength could be substituted. The lenses were cut square so that the correct prism effect could always be got when they were inserted into the frame.

Operation for Chronic Adhesive Catarrh of the Middle Ear (Tympanoplasty).—**H. A. Kisch, F.R.C.S.**—*Case 1:* Boy, aged fifteen, deaf for years in both ears. No throat or nose trouble. Not improved by catheter treatment. Membrane very retracted; malleus slightly movable. Paracusis Willisii present. Operation was performed in January, 1912, on the right ear. The tympanic membrane, the malleus, incus, and all the mucous membrane of the middle ear were removed through a retro-auricular incision. A foramen was gouged in the promontory and the cavity then grafted. The stapes was fixed. After-treatment by massage was carried out, and for the last two months ionisation with salicylate has been used. Hearing tests, before and after operation:

	Before (January 15, 1912).		After (October 31, 1912).	
	Air-conduction.	Bone-conduction.	Air-conduction.	Bone-conduction.
C ₁₂₈	-120	+ 11	- 22	+ 7
C ₂₅₆	- 56	+ 12	- 80	+ 3
Whisper		1 ft.		9 in.
Voice		9 in.		6½ ft.

Case 2.—Girl, aged nineteen; deaf for years. No improvement on treatment. Has slight hypertrophic rhinitis. Membrane retracted and slightly movable. Paracusis Willisii present. A similar operation to that of the previous case was performed in January, 1912. The stapes was fixed. Patient had severe headaches afterwards, which subsided later. The hearing was improved immediately after operation, but relapsed six weeks later, the patient becoming totally deaf and suffering from severe tinnitus. This did not improve, and a second operation was undertaken. The skin-graft was removed; the foramen in the promontory was apparently filled up with fibrous tissue. A fresh graft was inserted. After this the hearing improved. There has been one rather severe relapse with subsequent recovery. Similar after-treatment to the previous case has been used. Hearing tests before and after operation:

<i>Before (December 2, 1911).</i>				<i>After (October 31, 1912)</i>			
	Air-conduction.		Bone-conduction.		Air-conduction.		Bone-conduction.
C ₁₂₈	Not heard	.	+ 10	.	- 30	.	+ 9
C ₂₅₆	- 55	.	+ 4	.	- 54	.	+ 15
Whisper	.	4 in.	.	.	5 in.	.	
Voice	.	10 in.	.	.	5½ ft.	.	

Mr. LAKE pointed out the need for using some definite formulae for ear-testing in order properly to be able to ascertain the value of these operations. Tests were of great importance if one could look at them through, as it were, one's own spectacles.

Mr. JENKINS asked whether the case was considered to be one of oto-sclerosis, as the patients had paracusis. Also, how did Mr. Kisch estimate the paracusis? Did he take the word of the patient for it, or had he other means of arriving at it?

Mr. MOLLISON asked, in regard to the second patient, what permanence there was likely to be, as he could not make her hear conversation at 2 in. that afternoon. If such cases were going to improve as the first one did, the operation might well become very frequent.

The PRESIDENT said the gross evidence given by the patients seemed satisfying and encouraging.

Dr. URBAN PRITCHARD said he thought these cases had been brought forward at the wrong time: if they could be seen in two months' time one could judge better. His testing when the room was quiet did not bring out such a favourable result as the notes indicated. One ear was still suppurating.

Mr. MUECKE said that one of the cases was suppurating. It is well known that the majority of such cases hear better when the ear is discharging than when dry: could not this account for the small increase of hearing?

Mr. KISCH replied that the suppuration in the ear was due to the use of ionisation, as before this was used the ears were dry. The discharge came from the posterior wall of the meatus. He agreed with Mr. Lake about the tests. Both the patients had given practical evidence of improvement; the boy had got work since he could hear, and the girl could hear the bells in the house. These cases varied from day to day, but 2 in. was less hearing than was the actual. They were not true oto-sclerosis, as the stapes was not fixed by bone. In a case of Dr. McKenzie's the stapes was fixed by bone, and the sensation imparted on probing was different. It was important to ascertain beforehand whether it would be necessary to open the promontory, as it greatly increased the risk of the operation. He had used the increase of bone-conduction as the guide: the greater the bone-conduction the more fixed was the stapes. He took the patient's word for the paracusis.

Chronic Diffuse Labyrinthitis; Horizontal Canal drained by a Strand of Silkworm Gut inserted into the Canal and buried extra-durally.—E. A. Peters, M.D.—Male, aged fifty-eight. The patient (February 13) complained of the Ménière syndrome—vertigo, sickness, deafness and faintness. Since eighteen years of age he has experienced attacks of sickness of a migrainal type, which have been less pronounced the last two years, but have been accompanied by a tendency to fall backwards and a waterfall noise in the left ear. The deafness has progressed insidiously, and the patient is unconscious of an increase of

deafness with each attack. The vertigo, often associated with pain referred to the side of the head, has increased, and the patient is often unable to work or even go about alone. Hearing tests:

	Right ear.	Left ear.
Stop-watch	12/60	M3 60
Tuning fork 128 on mastoid	— 9 sec.	— 9 sec.

In the rotating chair the patient experienced no giddiness, and nystagmus was either absent or irregular, as if the function of the canals had been affected. He could turn round when the eyes were shut without inconvenience. The results of caloric tests were similar to those obtained by rotation. For ten weeks he was medically treated with diminished fluids, calomel and potassium iodide, without improvement; the attacks became more violent in character, and at times he was unable to cross his dwelling-room. Operation on May 2. Neumann's or the posterior route to the canal was taken, and the antrum opened without disturbing the deeper lining of the external auditory meatus or the middle ear. The horizontal canal was uncapped for 1 mm., and the dura mater exposed anterior to the lateral sinus. A medium strand of rigid silkworm gut was selected and inserted into the canal 4 mm., while the other end was bent about 25 mm. beneath the dura. Grafts were applied in a cavity filled with saline, which was abstracted by suction apparatus. The temperature was 99° F. next day, and on the third day the patient sat up for a short time, but complained of giddiness. The grafts did not take well, otherwise his convalescence was uneventful but prolonged; the dressing was continually soaked by clear fluid escaping from the opened canal. The wound is now healed; the strand of gut cannot be seen, but the membrana tympani is slightly injected. His general condition has vastly improved, the nausea and giddiness diminishing daily. He has now resumed his ordinary work, and climbs ladders with impunity. The hearing tests taken in September were:

	Right ear.	Left ear.
Stop-watch	14 60	Contact.
Speaking voice heard by the left ear at 9 ft.	—	—
Tuning-fork 128 on mastoid	— 6 sec.	— 7 sec.
" C ₁ "	— 6 sec.	— 6 sec.
" C ₃ "	— 3 sec.	— 5 sec.

The rotation and caloric tests gave results similar to those observed in the first instance. I would remark that the tests suggest that the same pathological process has insidiously invaded both labyrinths, and the left labyrinth more particularly. Whether it was that particular affection of the left labyrinth which caused the vertigo and sickness, and this was relieved by the drainage instituted, or whether these symptoms were the result of the physiological interaction of two diseased labyrinths, is a matter open to doubt, and can only be cleared up by the subsequent history of the case.

Mr. JENKINS said the case was similar to one he reported some time ago, particularly in regard to nystagmus on rotation and giddiness. He drained the labyrinth by a method slightly different from that which Dr. Peters had carried out. He simply opened into the peri-lymphatic space. He did not put in silk or silkworm gut to keep up the drainage for any period. That patient was now quite well and at work, and had no attacks of giddiness. The question was still in an experimental stage and should not be approached rashly.

Osteoma of the Mastoid.—R. S. Cocke, F.R.C.S.—(Girl, aged twelve; swelling noticed, the size of a pea, in January, 1907. In February, 1908, it was the size of a walnut, pressing on and partially closing the cartilaginous meatus. Removed with chisel; another growth, very much smaller, removed at the same time. Nothing noticed till eighteen months ago, when her mother saw a swelling in the same region, starting like the former, which has now grown to its present size. No pain ever; hearing normal. Microscopical section of original growth shows typical osteoma.

Rubber Nozzle for Syringing Backwards and Clearing out the Cul-de-sac formed by the Radical Post-aural Operation.—Urban Pritchard, F.R.C.S.—This is an improvement on the similar metal nozzle shown at the meeting of the Otological Section, December 5, 1908. Being soft, it can be introduced deeply into the meatus without producing pain. It can be fixed on to the nozzle of almost any syringe.

Abstracts.

LARYNX.

Lewies, Harry.—*The Clinical Aspect of Laryngeal Tuberculosis.* "Zeitschr. f. Laryngol." Bd. iv, Heft 4.

In this paper the author gives us the results of five years' observation of the material at Professor Seifert's clinic at Würzburg. The number of cases of laryngeal disease observed in this period was 332, and of these, 183 were cases of laryngeal tuberculosis. This percentage (55 per cent.) is rather high; the usual percentage appears to be about 33 per cent., but twelve cases of lupus are included in Lewies' statistics. [N.B.—The tuberculin test was not used for the diagnosis of the cases as it was not considered suitable for patients seen at an ambulant clinic.] Of the 183 cases, 48 were observed in the second decennium, 60 in the third, and 41 in the fourth; 130 men were affected as compared with 53 women. Of the 171 cases of laryngeal tubercle (omitting the cases of lupus), three appeared to be primary. Of the 168 secondary cases the infection of the larynx had occurred from the upper respiratory tract, pharynx, fauces, etc., in seven instances; the remaining cases were secondary to lung disease. Of the 171 cases, 80 were seen in the first stage of the lung disease, 60 in the second, and 18 in the third: others not mentioned.

With regard to the seat of the lesion in the larynx the vocal cords were most frequently affected (57 cases). Next in frequency were those cases in which the false cords, the posterior commissure and the upper aperture of the larynx were involved. *Modes of infection.*—Lewies supposes that the primary cases are due to inhalation, while in the miliary cases the infection, of course, occurred through the blood-stream. Besold and Gidionsen favour the view that laryngeal tuberculosis is due to infection by way of the lymphatics either from below or from above, but injection experiments have failed to prove any lymphatic connection between the cervical and the thoracic vessels; further experiments on animals have shown that the larynx may be infected through the mucous membrane. Again, in cases of unilateral disease of the lungs the lesion in the larynx, if unilateral, is by no means always on the same side as

the lung trouble, and microscopic examination of tubercular larynges obtained from animals showed that infection had come from the surface. If the infection occurred by way of the lymphatics one would expect enlargement of the cervical glands, but this does not occur. *Various types of lesion.*—In the three cases of early paresis of the cords the mucous membrane was anæmic, and, in one of those cases, Lewies later, confirmed the diagnosis by finding well-marked tubercular perichondritis. Of the five cases of tubercular tumour two were situated in the ventricle, two on the vocal cords, and one at the anterior commissure. The details are given of one very interesting case which was diagnosed in 1908 as "amyloid disease of the larynx"; the false cord on the left side was markedly swollen, and bulged upwards by a tumour apparently growing in the ventricle; the swelling was removed with cutting forceps, and on microscopic examination only amyloid change was found. Two years later the trouble recurred, and on the second occasion microscopical examination showed that the condition was tubercular. Lewies records eighteen cases of perichondritis (three early and fifteen well-marked): he notes Hajek's opinion that in these cases mixed infection is always present. The writer also calls attention to two cases in which in the early stage the mucous membrane of the larynx was of a dark red or purplish colour; in one of these a typical picture of tubercular laryngitis subsequently developed. Six cases of lupus were observed, five of which were secondary to the disease in the face, nose or pharynx; of the six cases, four were females and two males. The epiglottis was affected in all, while in one or two the false and true cords were also involved. Three of the cases were cured.

With regard to treatment, Lewies remarks that absolute rest of the voice is very hard to carry out except in a sanatorium, and is especially hard for the working classes. He gives notes upon the results obtained with various proprietary remedies which were supplied to the clinic by the makers (page 493).

As a local anæsthetic he mentions the cocaine alypin solution (āā 5 per cent.). In sensitive patients this was used before the injection of menthol oil. For the patient's own use Lewies recommends anæsthesine inhaled from a glass apparatus shaped like a tobacco-pipe with an elongated curved stem. In one case an alkaline watery solution of methylene blue and methyl violet appears to have done good. The congestion method was used in a few cases, but was found unpleasant.

Surgical treatment.—Lewies has collected 134 cases of amputation of the epiglottis from various authors. A cure was obtained, as far as the epiglottis was concerned, in 77 per cent; the laryngeal disease was cured in 14 per cent., while the patient was cured in 9 per cent. Lewies himself operated on five cases with Alexander's guillotine: the result was good in all but one case, in which there was severe hæmorrhage.

In a number of patients tubercular granulations were enucleated with Heryng's instruments and the part subsequently painted with lactic acid. Many cases also were cauterised. In only two cases was tracheotomy performed, one of which did very well after operation.

The results of treatment are given as follows: *Cases*, 183; cured, 9; nearly cured, 4; improvement, 32; unchanged, 12; still under treatment, 3; died, 7.

The weak point of the paper seems to be the fact that a large number of the cases (116) were only seen on one occasion, and that the diagnosis was made without the aid of the tuberculin test.

J. S. Fraser.

NOSE AND NASO-PHARYNX.

Guthrie, Thomas.—The Recurrence of Adenoids. "Lancet," April 20, 1912, p. 1054.

The author describes a case in which the recurrence of adenoids appears indisputable. A photograph shows the original mass removed at three years of age, and the second growth taken away eighteen months later. The remarks made by the author are very sensible.

Macleod Yearsley.

Onodi, Prof. (Budapest).—The Opening of the Cranial Cavity and Exposure of the Brain from the Accessory Sinuses of the Nose. "Zeitschr. f. Laryngol.," Bd. iv, Heft 1.

The article is full of statistics as to the height, breadth and depth of the frontal and other sinuses. Radiograms show that these sinuses are absent on both sides in 5 per cent. of cases. Prof. Onodi has carried out 1200 X ray examinations of the accessory sinuses, and gives illustrations showing the appearances presented when the frontal sinuses, as outlined by the X rays, are projected on the frontal lobes of the brain; in some cases they may come into relation with the temporo-sphenoidal lobes. The writer also gives directions for exploring the brain after removal of the posterior sinus wall.

J. S. Fraser.

Sieur and Rouvillois.—Report on Surgical Treatment of Frontal Sinus: a Critical Study of Post-operative Complications. "Arch. Internat. de Laryng., etc.," July-August, September-October, 1912.

In the report the authors have had above all in view to show that the importance and number of indubitable post-operative complications in the surgical treatment of these affections has been singularly exaggerated. In the first chapter they study the evolution of frontal sinus surgery, an evolution to which French specialists, and particularly Luc, have usually attributed much importance. It is a sort of critical review of all the methods which have been successively employed, and by which one can render account of the progress realised from the surgical and therapeutic point of view. In the second chapter are grouped together the observations of the principal complications imputable to surgical intervention, hæmorrhage, orbito ocular accidents, osteomyelitis, thrombo-phlebitis, and septic pyæmia, meningitis, and cerebral abscess. These diverse complications, of which the start shows in many cases a period of origin anterior to the operation, evolve more readily under predisposing causes. The third chapter is devoted to these causes. The authors range under two principal headings: (1) Predisposing cause inherent to the patient: surroundings, age, sex, general state and induced local conditions; (2) predisposing causes inherent to the operator in the execution of the operation. Among the first that of most importance should be attributed to the general state, chronic infections, syphilis, infectious maladies, etc., to the anatomical formation of the affected sinus, the extent of its lesions, and the virulence of the causal organisms. The fourth chapter is devoted to the consideration of post-operative infection. This method of infection is peculiar owing to the anatomical conformation of the frontal sinus and the importance of its relations. But after having successively passed in review the propagation of inflammation by continuity, by veins and lymphatics, the authors come to the conclusion that the veins play the most important part *role* in this connection. This

is in agreement with more recent anatomical research and clinical observations. The study of post-operative procedures and of the likely and predisposing causes of post-operative complications and the discovery of the ordinary method of infection should assist us to means of avoiding these complications. These means are found, according to the authors, in the judicious choice of the operative method, in the preparation of the patient, and in the performance of the operation. The most important point of this stage, which constitutes the fifth and last chapter, considers specially the employment of the endo-nasal method and the practice of trephining by the external route according as one finds himself in the presence of an acute sinusitis, of pan-sinusitis, or of a spreading cranial osteomyelitis. The authors sum up their work by drawing the following conclusions: (1) Let us be clear-sighted clinicians in our general and local diagnosis, and perform operations proportional to the resistance of the patient and the extent of the lesions. (2) Let us be eclectic surgeons without pinning ourselves to a systematic procedure, but doing all that is necessary and no more. (3) Let us be prudent and painstaking operators, and we will avoid the dangers inherent to intervention. Although we cannot hope ever to entirely be free from post-operative complications, such cases would exist as isolated exceptions. The treatment of frontal sinusitis should not make an exception to those of other affections which would necessitate the aid of surgery. We should add, nevertheless, that owing to the difficulty of treatment inherent to the anatomical situation of the sinns, frontal sinusitis ought always to be considered as a serious affection. This is why the authors consider that they cannot do better than terminate their conclusions with the words of Gerber, that "insufficiently experienced operators should withhold their hand." Rhinology should keep itself well abreast of the practice of modern surgery. This condition is necessary to our speciality in order that it can pretend to an independent place among the other branches of surgery.

J. D. Lithgow.

E.A.R.

Hammond, P.—A New Mastoid Retractor. "Boston Med. and Surg. Journ.," June 27, 1912, vol. clxvi, No. 26.

The instrument may be used in combination with a tape passed through the meatus, or alone. It is self-retaining. It consists of anterior and posterior members, which resemble Volckmann's retractor, and when in use are placed within the corresponding margins of the wound. The connecting portion between the two members is shaped like a "wish-bone" and is reversible, allowing the instrument to be used for either ear, with this portion either above or below the operative field.

Knowles Renshaw.

Mahler, L. (Copenhagen).—On the Pathological and Clinical Aspect of Otogenous Aseptic Sinus Thrombosis. "Monats. f. Ohrenh.," Year 45, No. 11.

With a brief review of the only nine cases of this nature which he had been able to discover in the literature up to date, the author gives the following account of a man, aged sixty-seven, who came under his care April 17, 1911. The patient had had no affection of the ears till two months previously, when he caught cold, which was accompanied by pain in the right ear and a purulent discharge. For this he was treated in hospital and discharged fourteen days previously, since when he had been

quite well till four days ago, when the earache and otorrhœa reappeared. For the last two days the otorrhœa had ceased. He complained of right-sided headache and pain, but had no vertigo. There was slight tenderness of the mastoid, which was otherwise normal, sagging of the postero-superior meatal wall, pus in the fundus, small obvious perforation. Caloric nystagmus normal. Whisper *ad aurem*; bone-conduction greater than air-conduction. Temperature normal.

The perforation was enlarged in the tympanic membrane, but as the following day the headache had not abated the mastoid process was opened, the cells and antrum being found filled with granulations and pus.

All went well till April 22, when the temperature rose to 105° F. and the pulse to 120, accompanied with restlessness and muttering. No vomiting or convulsions. No nystagmus. Pupils equal and reacted to light. Reflexes increased. Kernig positive, neck stiffness. Lumbar puncture yielded about 10 c.cm. turbid fluid under strong pressure. Caloric response and hearing present in the right ear. As the cerebro-spinal fluid showed numerous polynuclear leucocytes and a Gram-positive coccus in small groups craniotomy was performed and the temporo-sphenoidal area explored, with a negative result, except an excessive flow of fluid. Then the posterior fossa was investigated, when the sinus was found surrounded by a thick layer of granulations and filled with a pink, firm organised thrombus. This was removed till venous bleeding occurred from both directions. Further exploration of the cerebellum was negative. The patient died that evening.

Post-mortem: There was a purulent convex leptomeningitis. No abscess. Remains of the thrombosis as found at the operation.

Histologically the thrombus was found to be in an advanced state of organisation, but no bacteria could be discovered either in it or in the granulation-tissue with which it had been surrounded, nor was there any sign of pus; moreover, no growth was obtained by culture.

A further critical survey as to the causes which may give rise to aseptic thrombosis, based both on the experience of this case and also on the other accounts already mentioned, with a reference to the latter, concludes the article.

Alar. R. Tweedie.

Blegvad, N. Rh. (Copenhagen).—Otogenic Pachymeningitis interna purulenta. "Arch. f. Ohrenheilk.," Bd. lxxxiii, Heft 3 and 4, p. 247.

Purulent internal pachymeningitis is commoner than we generally suppose, seeing that it forms one of the steps by which infection in the tympanic cavity may reach the soft membranes. In this report of two cases—one fatal and the other saved by operation—Blegvad supplies us with an analysis of the twenty-seven cases of the disease which he has found in the literature. Pathologically speaking, the disease process presents a gradation of local severity from inflammatory fibrinous exudation on the cerebral surface of the dura to abscess formation. At any stage in the process the disease may lead to purulent leptomeningitis, but it seems evident that sometimes a considerable period of time elapses before this dangerous event occurs. Cases are on record in which the abscess has penetrated the dura and has discharged through the ear or has led to a collection of pus on the surface of the skull. When subdural abscess forms it may lead to encephalitis with superficial necrosis of the brain tissue, cortical abscess or ulceration of the brain, and the consider-

able pressure upon the convolutions may flatten them and even lead to a depression on the surface of the brain.

Inasmuch as the disease process is usually associated with other intra-cranial complications, the symptomatology of this particular lesion is not so clear as to render its diagnosis easy, which is unfortunate, seeing that the prognosis in cases of timely operation is extremely good, the advance of infection towards the soft membranes being effectually checked.

If an abscess forms the pressure upon the cerebral cortex induces ocular paralyses, aphasia, Jacksonian epilepsy and contra-lateral paresis, but although pyrexia is common and the pulse-rate frequently raised, the symptoms are not sufficiently definite to enable a distinction to be made between subdural abscess and cerebral abscess. The cerebro-spinal fluid, in the cases in which it was examined, was clear and showed little or no increase in its cell elements.

The treatment of simple subdural inflammation or abscess presents no difficulties, since effective drainage can be secured by an incision through the dura without any very free removal of bone.

Dan McKenzie.

Rejtő, Alexander.—**A New Method of Examination of the Labyrinth (Barány's Pointing Test).**—"Pester Med.-Chir. Presse," No. 20, 1912.

Barány's pointing test is a method of displaying the deviation of the skeletal muscular movements resulting from labyrinth disorders. It is conducted as follows: The patient having closed his eyes, he is made to stretch his arm fully out, and to touch with his finger the finger of the examiner. Then he is asked to sink his arm to his knee and once more to raise it so as to touch the surgeon's finger, again. In normal cases the attempt to do so is always successful, even when the arm is stiff or paretic. In labyrinth, and also in cerebellar troubles, the arm and finger deviate during this movement in a direction opposite to that of the nystagmus.

[That is to say, the arm deviation takes the same direction as the slow component of the nystagmus.—D. M.]

Dan McKenzie.

Ruttin, Erich.—**On Recent Traumatic Lesions of the Labyrinth.**—"Monats. f. Ohrenheilk.," No. 4, Year 46.

Six cases are quoted in detail, all the result of a fall in which the labyrinth was affected, and all of which recovered without operation, although various labyrinth symptoms persisted at the time of writing.

From these cases the author differentiates the following types of labyrinthitis: (1) Diffuse traumatic labyrinth destruction. (2) Diffuse traumatic lesion of the labyrinth. (3) Circumscribed traumatic labyrinth lesion.

No. 1 must be regarded as the result of fracture or fissure of the labyrinth with hæmorrhage into its interior, causing irritation or destruction of its soft parts.

In Nos. 2 and 3 there is probably no fracture, and the injury is of a comparatively mild degree.

The conditions, symptoms, and prognosis are well summarised in the following table:

Symptoms.		Caloric reaction (if available).		Rotation reaction.		Prognosis.	
		Cochlea.		Vestibule		Various.	
Diffuse traumatic destruction of labyrinth	Deaf, ? tinnitus	Nystagmus, rotatory to sound side; dizziness; vomiting; disturbance of equilibration		Mental haemorrhage ? discharge of fluid ? facial paralysis ? If unconscious eyes directed to the side of lesion		No reaction as regards the horizontal and anterior canal	
Diffuse traumatic lesion of the labyrinth	Deafness or marked depression of hearing, tinnitus	Nystagmus, rotatory to the sound side; dizziness; vomiting; disturbance of equilibration		Mental haemorrhage ? discharge of fluid ? facial paralysis ?		Lack of response on simultaneous irrigation of both ears	
Circumscribed lesion of the labyrinth	Keenness of hearing reduced, tinnitus	Nystagmus, rotatory to the sound, the diseased, or to both sides. Dizziness; vomiting; disturbance of equilibration ?				Not affected	
						Depression of hearing; tinnitus; dizziness ?	

This table, preceded by a very able debate on the cases and the types to which they belong, should be of great service towards the description, diagnosis, treatment, and prognosis in lesions of the labyrinth.

Alex. R. Tweedie.

Kerrison, Philip D., M.D. — **The Vertigo of Vestibular Paralysis.**

"Laryngoscope," October, 1911.

In addition to the vertigo of vestibular irritation, so generally recognised, there is also a form of vertigo due to loss of vestibular function which has so far escaped notice. The accepted features of "vestibular vertigo" are its occurrence during the acute stage of labyrinthine irritation, its constant co-existence with nystagmus, and with a subjective sensation of the rotation of surrounding objects.

If Bárány's law be accepted that vestibular vertigo is invariably accompanied by vestibular nystagmus, then when the nystagmus has subsided the vertigo must of necessity have also ceased.

The author maintains that this is not always so, but that it will be frequently found that after the vertigo and nystagmus due to vestibular irritation have subsided another variety of vertigo may be present due to loss of vestibular function. It is characterised by being only noticed on the performance of sudden unaccustomed movements, and differs from the former variety in the absence of nystagmus, sense of rotation, or a tendency to fall in any given direction.

The occurrence of this condition is explained by the defective orientation due to loss of vestibular function. When the vestibular function is lost its place in the orientation of the body has to be taken over by the muscular, arthrodial, tactile, and visual senses.

This readjustment takes a variable time in different subjects, and until it is completed there will be a liability to vertigo on sudden and unusual movements. Thus a man, aged twenty-eight, who has become suddenly totally deaf as the result of a syphilitic infection, showed complete absence of both the caloric and rotatory vestibular reactions, but yet complained as much of vertigo as of deafness. He was compelled to keep his eyes on the ground while walking, but could walk straight and stand steadily with his eyes shut. He had no nystagmus, sensation of rotation, or tendency to fall in any given direction.

Since both vestibules were inactive his vertigo was presumably due to the as yet incomplete compensation by the other senses.

A. J. Wright.

PHARYNX.

Badgerow, Geo. W. — **Pharyngeal Suppuration: Course and Direction of Various Types.** "Lancet," March 23, 1912, p. 780.

After considering certain points in the anatomy and physiology of the pharynx, the aetiology of pharyngeal suppuration is discussed, and the various types are classified, according to the seat of origin, as (1) lymphoid, (2) submucous, (3) subaponeurotic, (4) prevertebral. The first is by far the commonest. In the second dysphagia is the most prominent symptom. The most important structure in connection with the pharynx is the pharyngeal aponeurosis and its attachments. The muscles are important because their involvement gives rise to one of the most characteristic symptoms — dysphagia.

MarLeod Yearsley.

Stewart, D.—**Pulmonary Embolism as a Sequel of Diphtheria.** "Lancet," March 30, 1912, p. 866.

The subject of this rare sequel of diphtheria was a female child, aged four. The attack of faucial diphtheria was mild, but, after fourteen days she showed signs of pulmonary trouble and died in twenty-four hours. A large infarct of the right upper lobe was found, with no valvular lesion, but with some dilatation of the right side of the heart.

Macleod Yeatsley.

Mackay, Charles W.—**The Value of Temperature Readings in Administration of Diphtheria Antitoxin, and the Value of Large Antitoxin Dosages.** "Australian Medical Journal," June 22, 1912.

Temperature observations are made every four hours. The initial dose cannot be decided on the temperature, but if the four-hourly readings do not show a rapid fall the dose is repeated in eight to twelve hours. Where no fall is shown the initial dose is too small. In mild, recent cases the initial dose is 6000 to 8000 units. In severe cases, of some days' duration, the initial dose is from 16,000 to 30,000 units. The temperature observations are a useful guide in faucial cases only. The observations were on 400 cases, in a children's hospital. Charts illustrate paper.

A. J. Brady.

REVIEWS.

The Skiagraphy of the Accessory Nasal Sinuses. By A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E., and W. G. PORTER, M.B., B.Sc., F.R.C.S.E. Edinburgh and London: W. Green & Sons, 1912. Pp. 45, plates 40. 10s. 6d. net. (Continuation of previous review.)

The reviewer would wish to add to what he has already stated with regard to this excellent atlas, that the technical skiagraphical part of it is mainly the outcome of the labours of Dr. Porter, and we see in it the admirable result of the combination in one person of the clinician and the radiographer. Dr. Turner has expressed his appreciation of the value of the co-operation of such a colleague in a work which his own wide clinical experience and judgment have enabled him to organise in so useful and instructive a way.

Dundas Grant.

Pye's Surgical Handicraft: A Manual of Surgical Manipulations, Minor Surgery, and other matters connected with the Work of House Surgeons and Surgical Dressers. Edited and largely rewritten by W. H. CLAYTON-GREENE, B.A., M.B., B.C., F.R.C.S. Sixth edition, fully revised, with some additional matter and illustrations. Bristol: John Wright & Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd., 1912. Price 12s. 6d. net.

Walter Pye's work on "Surgical Handicraft" seems to have equalled the popularity of its lamented author. The sections on diseases of the ear, nose and throat are, as before, in the hands of Mr. Carson, who has brought it still further forward, and it may be said now to be quite up-to-date. The chapter on the X rays and taking of skiagrams is, of course, mainly devoted to considerations of fractures, but the section on the examination and interpretation of skiagrams is full of practical

suggestions, and well worth the study of those who (like many of us), while not professing to be masters of the art of using the X-ray apparatus, feel the necessity of being able to judge of the results, more particularly in connection with our various specialities.

Dundas Grant.

CORRESPONDENCE.

CURETTAGE OF THE FRONTAL SINUS.

To the Editor of THE JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

DEAR SIR,—I have read with great interest Dr. Dan McKenzie's article on "Osteomyelitis of the Skull." I have now operated on a very great number of frontal sinuses, but have never seen the complication. This argues either extraordinary good luck on my part, or that the method of operating in Dublin is different from that employed in other places.

In the interest of present and future sufferers from that complaint, and, indeed, hardly less of the operators, I am encouraged, by a sentence which occurs in Dr. McKenzie's paper in this month's issue of your JOURNAL, to hope that this latter may be the case. He says on page 24, in speaking of possible causes, "over-zealous curetting of the walls of the sinus is likewise viewed with a suspicious eye in several quarters." I have always carefully avoided curetting the frontal sinus, a practice to which I was led by a sentence which I first read twenty years ago in McEwen's "Pyogenic Diseases of the Brain and Spinal Cord." I cannot give the exact reference as I have not the book by me, having lent my copy to someone too wise in his generation to return it, and the book is now, unfortunately, out of print. McEwen draws attention to the danger of infections, not merely of the skull, but of the brain, following scalp wounds, where the pericranium has been penetrated and the bone scratched. He shows that infection may lie dormant a long time, and recommends that in the treatment of such cases in the first instance, the greatest pains should be taken to obliterate all traces of the original scratch, however slight. Any instrument used to curette an infected frontal sinus is itself necessarily infected, and the curette cannot be used, even lightly, without risk. I therefore have always dealt with the mucous membrane by wiping it away with a piece of gauze moved by a steel probe. It is only necessary to wipe the mucous membrane in the gentlest manner and it comes away for the asking. You then substitute for the epithelial membrane a granulating surface, and this is the whole essence of the cure.

Yours faithfully,

39, Merrion Square, E.,
Dublin.

R. H. WOODS.

January 4, 1913.

BOOK RECEIVED.

Allgemeine Akustik und Mechanik des menschlichen Stimmorgans. Von Dr. Albert Muschold. Mit 19 Photographien des menschlichen Kehlkopfes auf 6 Tafeln und 53 Abbildungen im Text. Berlin: Julius Springer, 1913.

THE
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THE SEMON LECTURES, 1913.

(Delivered at University College, January 22 and 24, 1913.)

SIR FELIX SEMON—HIS WORK AND ITS INFLUENCE ON
LARYNGOLOGY.

BY P. McBRIDE, M.D., F.R.C.P.E., F.R.S.E.

LECTURE I.

Sir Felix Semon.

WHEN asked by the Board to deliver these lectures on the work of Sir Felix Semon and its influence on laryngology I fully appreciated the honour that had been done, and the responsibility which had been imposed upon me. While highly appreciating the former, I in no way under-estimated the latter. This lecture will not only be the first Semon lecture, but will also—if I mistake not—be the first of its kind which will have been delivered in this country.

In considering the influence exerted by Sir Felix Semon on the progress of laryngology the subject naturally falls into two divisions, viz. (1) the man; (2) his writings. While the latter—both those dealing with matters purely scientific, and those which

have had for their aim the elevation of the specialty—are of the very highest value, I cannot think that they alone would have accomplished so much had it not been for the marked and most remarkable individuality of their author. For this reason I must ask you to bear with me while I enter in some detail into questions historical and even biographical.

Felix Semon, the eldest son of S. J. Semon, stockbroker, was born in Danzig in 1849, but as his family removed to Berlin his education was carried on at the "Friedrichs Gymnasium" of that city, and he had the inestimable benefit of tuition from Professor Laas, who was afterwards promoted directly from the position of a schoolmaster to that of Professor of Philology in the University of Strassburg. To this preceptor Semon is inclined to attribute much—to use his own words, he thinks that if he has learned "to think and write logically, this is almost entirely due to the stern teaching of this master." From school, after passing the necessary examination, he went to Heidelberg to begin his medical studies under Helmholtz, Kirchhoff and Bunsen, but owing to an accident had soon to continue his curriculum at Berlin. This was again interrupted by the Franco-German war, when Semon served as a "one year volunteer" in the second regiment of Uhlans of the Guard. He was present at the sieges of Metz and Paris, and at the battles of Amiens, Bapaune and St. Quentin, receiving the war medal with five clasps, and qualifying at the end of his service as an officer of reserve. Returning to Berlin in 1871 he had still three months left to serve, and it was very characteristic of his energetic and sporting temperament that, at his urgent request, he was allowed to put in this time in rough-riding in the remount department. Meanwhile his medical studies were resumed, and he obtained his M.D. in 1872, and passed the state examination in the following year, after which he studied at Paris, Vienna, and finally London. In Vienna he frequented the clinic of Professor Stoerk, the late noted laryngologist, and in London he became a regular attendant at the Golden Square Throat Hospital. The large material there, and the interest he took in working at laryngology, eventually led him to the determination to devote himself to diseases of the throat. In 1876 he became a member of the College of Physicians, was soon appointed one of the physicians to the Golden Square Throat Hospital, and thus began to practise in London.

In the year 1879 Semon took a step which had the effect of influencing his whole future for good when he married the

accomplished and charming Miss Redeker. To all, Lady Semon is known as a great singer, to many as a kind and tactful hostess, but to those who are privileged to know her well, even these attributes sink into insignificance compared with her qualities as a wife and mother. She combines in herself the rarely associated gifts of domesticity and art, of great insight into character and human kindness, of a thorough knowledge of the world and true charity. It is, therefore, no mere form of speech to say that Semon's future must have been powerfully affected for good by obtaining thus early such a helpmate.

While waiting for patients he was not idle, for in addition to translating into German the first part of Morell Mackenzie's large work, which contained in foot-notes very many valuable additions from his pen, he found time to publish accounts of many interesting cases and also to produce papers of a more important nature before 1881. One of these dealt with the subject of mechanical impairment of the functions of the crico-arytenoid articulation—a condition which had certainly been previously observed and referred to by various authors, but which had not been systematically described before Semon took the matter up. Incidentally I may here remark that while his writings as a whole have been widely read and appreciated, I am not quite sure that this particular piece of work has ever earned the attention which it undoubtedly deserves. I have at this point purposely referred to Semon's literary career before 1881, because in that year the International Medical Congress met in London, and in this connection he took the first of many steps which had for their ultimate goal the advancement in status of laryngology. Having, while dining out in 1880, heard the forthcoming congress discussed, he asked the General Secretary—Mr., afterwards Sir William, MacCormac, who was present—whether laryngology had been recognised in the proposed programme. The answer was in the negative, but at the same time an invitation was extended to Semon to meet and discuss the subject. I do not wish to stir up old sores nor to touch upon matters which might revive painful memories. Let it suffice to say that owing to the action and insistence of Semon the specialty was so far recognised as to be assigned a subsection under the presidency of Sir George Johnson, who at the same time a distinguished physician was also a recognised authority on throat affections, while the secretarial work devolved upon Semon, De Havilland Hall, and T. J. Walker, of Peterborough. How efficiently these duties were carried out was shown by the very great success of the

meetings of the subsection, which, had it not been for the peculiar circumstances of the time as they affected laryngology, would probably have been a full section.

With Semon's further work, both scientific, and as it concerns the advancement of the position of the specialty, I shall deal later. I have merely mentioned his contributions and his important influence in obtaining the recognition of his own special branch in the International Congress to show that he had accomplished much between the year 1877, when he began practice in London, a young and unknown foreigner, and 1881. This remarkably rapid rise to a position of influence becomes still more astonishing when it is remembered that at the time when it occurred laryngology was under a cloud, and that there was a tendency among the leaders of the profession in this country to think and also to speak disparagingly not only of the specialty but even by implication of those who practised it. It may be well, however, to bear in mind that perhaps there was some justification for this attitude on the part of leaders of medical opinion. The specialty was young, and we must all recognise that specialism lends itself to abuse in the hands not only of the unscrupulous but also of the credulous. While the former may deliberately exploit the new field for their own profit, the latter may fall into error owing to absence of the logical and critical faculties which are so valuable as checks to excess. This may have to some extent accounted for the somewhat uncertain position of laryngology, but there can be no doubt that, particularly as concerns London and Edinburgh, the teaching bodies and hospitals were largely to blame for the general indifference displayed towards this and other specialties. In London some of the leading hospitals had no throat departments, and among most of those which had, the method of appointing the surgeon or physician-in-charge savoured more of comedy than of common-sense. The late Sir Henry Butlin has left on record how, when a laryngologist was wanted for St. Bartholomew's Hospital, there was not found one of the assistant surgeons willing to take it over, whereupon the Chairman said: "Well, then, Butlin must take it. He is the junior and he must do it." Now we all know that Sir Henry afterwards became one of the leading authorities on diseases of the larynx, but that fact did not make this method of appointment defensible, and yet in most leading London schools the throat department was run by one of the assistant surgeons or physicians, who very often passed on to other work just as he was beginning to know something of laryngology. In the Edinburgh Royal

Infirmiry there was absolutely no provision for the special treatment of throat and ear cases until 1883. The net result of this state of matters in London was the establishment of numerous more or less private hospitals, whose medical officers were free from such discipline and criticism as an appointment in a large public hospital guarantees, but on them the public had largely to depend for treatment and students for instruction. In Edinburgh there were lectures under the auspices of the Royal Colleges, while some clinics were given at dispensaries and the Eye, Ear and Throat Hospital, but as all these were far away from the University, and as the University authorities of the northern metropolis have never been in a hurry to adopt novelties, very few students or doctors availed themselves of either lectures or clinics. To sum up, then, while possibly the reserved attitude of the leaders towards our specialty may have been to some extent justified by the conduct of certain leading throat specialists, yet the absurdly conservative attitude of our teaching bodies led to the absence of a sufficient number of specialists of recognised position.

I have made this digression in order to show how heavily Semon was handicapped from the beginning of his career not only by being a foreigner, and at first by imperfect acquaintance with our language, but most of all by the extremely unsatisfactory status of laryngology. Let us, then, glance shortly at his rapid advance, and while doing so, it may occur to some of us to speculate on the proposition. If he advanced with this rapidity with all these things against him, what would he have done without them? It may be, however, that the very difficulties he had to face supplied the stimulus which fostered his energy and developed his character. Certain it is that to him the overcoming of difficulties added much to the pleasure of existence.

As we have seen, Semon made his mark in 1881 by the success of the subsection of laryngology, which was largely due to his initiative and zeal. In 1882 he was appointed Physician for Diseases of the Throat at St. Thomas's Hospital. The reports he published from time to time of his work there were really patterns of what such reports should be, and must have greatly enhanced his already rapidly rising reputation. In 1885 the Royal College of Physicians conferred upon him the title of Fellow—a distinction which had so far never been attained by anyone who devoted his whole attention to diseases of the throat. As the late Sir Henry Butlin said: "It was a recognition at once of his skill and knowledge of his profession and of the honourable manner in

which he conducted his practice." After this period, of course, he became established as one of the leading consultants of the country, and was also one of the most generally trusted by his *confrères*. In 1884 he had originated the *Centralblatt für Laryngologie*, an international journal published in Berlin, which, owing to careful editing and great organising ability on the part of Semon, at once stepped into a leading position, and soon became the foremost journal of its kind. Many—nay most—of what may be called the laryngological political articles which appeared in the *Centralblatt* were from the pen of Semon, and exercised a very strong influence on laryngology throughout the world. To a few of the most important I shall have occasion to refer again.

In 1893 he founded, by his own initiative, the Laryngological Society of London, to which were attracted most of the best of the younger specialists of Great Britain, and at his suggestion the society occupied itself chiefly with the discussion of cases and specimens, while set papers were avoided. In this way he hoped to obviate one of the chief dangers he always feared from special societies, namely, that work dealing with matters of common interest would be diverted from general meetings.

Honours—well deserved honours every one of them—continued to pour in. Semon was elected an Honorary Fellow of the Laryngological Societies of Berlin, Munich, Italy, Vienna, St. Petersburg, of the American Laryngological Association, and of the American Oto-laryngological Association, and Honorary President of the Madrid Laryngological Society abroad, and a corresponding Fellow of many others, while at home he has been honoured in the same way by the Laryngological Section of the Royal Society of Medicine. Although always a pure specialist, he has also received the Honorary Fellowships of the Dresden and Manchester Medical Societies, and of the Spanish Medico-chirurgical Academy. These distinctions show how great was his reputation and how cosmopolitan his fame as a worker in his own field. To further emphasise this, he was decorated by the Sovereigns of Prussia, Spain, Egypt and Zanzibar. Here he was created a knight in 1897, and received the additional honours of Commander of the Royal Victorian Order (1903) and Knight Commander of the Royal Victorian Order (1905), while he also had the great honour of acting as physician extraordinary to our late King, who honoured him not only with his confidence but also with his friendship. Previously, too, the German title of Professor had been conferred upon him, and up to the time of his withdrawal from practice he retained the position

of laryngologist to the National Hospital for Paralysis. I have thus passed, in very brief review, some of the honours and positions which fell to his lot, for to most of you they are well known. They show a career of rapid and uninterrupted success, which fittingly culminated in that wonderful and unique expression of affection and respect which arose on Semon's announcement that he proposed to withdraw from active practice in the heyday of his vigour. To mark the importance of the event and their appreciation of his services to laryngology his friends arranged—(1) to give Semon a farewell banquet; (2) to establish a lectureship to perpetuate his name—the same friends who organised the one contributing, according to their means, towards the foundation of the other.

Many of you were present at the dinner. You will remember how the guests included peers, both English and German, great financiers, prominent politicians, famous lawyers, members of both sexes distinguished in literature, arts, and on the stage, as well as many leading men of Semon's own profession, British, Colonial and Foreign. You will remember, too, how it was announced that subscriptions to the testimonial fund had been received from America, Austria, France, Germany, Italy, Russia, and Sweden. But most of all, you will remember the enthusiastic reception given by this great gathering of distinguished men and women from many lands to the guest of the evening. It would have been a great tribute of affection and respect for any man to receive in any country, but it must be looked upon as a superb achievement for a man who came to our shores thirty-four years before, an unknown foreigner, to have evoked such a demonstration by the work he did in a specialty which he had found under a cloud. To remove that cloud was a large part of his life-work, and that great gathering of friends of all kinds and many nations must have served to show him, among other things, how well he had succeeded.

I have thus shortly told the tale of Semon's success, and will now devote myself to an attempt to analyse, so far as I can, the qualities of the man which commanded this success. In doing so I shall hope to interest you all, but if there be any here who are beginning their careers, they may be gainers if I do my work reasonably well, for then I shall have placed before them the salient characteristics of a man who obtained fame and some measure of fortune, and who, I believe, on his path upwards never did anything he desired to screen from the light of day.

While I shall reserve for future discussion a more detailed consideration of Semon's scientific and literary contributions, it may be that in what I am now about to say I shall refer to some of them to illustrate certain points.

It goes without saying that he whose individuality we are discussing was, and is, gifted with quite an unusually powerful intellect. How far this is the result of heredity—his younger brother, Prof. Richard Semon, of Munich, is a biologist of world-wide fame—and how far of upbringing, education and general environment I must leave an open question. Possessed of this gift he proceeded to turn it to account by making himself a more than usually good all-round medical man. I do not say that in this lay the sole secret of his success as a specialist, but it contributed so far towards it that it prevented any possibility of his falling into that error so frequently associated with specialisation which narrows the mental horizon of the worker to the small domain of his own subject and tends to divorce him more and more from general medicine and surgery. Those of you who have carefully studied Semon's writings will agree with me that most of them touched the borderland between general medicine and laryngology. It will be admitted by most specialists that it is just here that the best work can usually be done, and it is the field chosen most frequently by the best intellects. Those who have known Sir Felix well must have observed the very wide knowledge he could display, when occasion required, of neurology, pulmonary disease, pathology, and of many other branches of our art. I was very much struck, more than twenty years ago, by a remark made to me by one of the then leading physicians of London. Semon and I had been going over his wards seeing the more interesting cases, and in private conversation with me afterwards the physician remarked, "I consider Semon one of our best physicians." I thought at first he had intended to refer to throat diseases alone, but found that it was not so, and, moreover, I discovered that Semon was a regular Sunday visitor to medical wards with a view to keeping up his general knowledge. In addition to his wide reading and large experience, he had quite an unusual power of utilising this experience. This faculty I have twice known come into play in connection with cases which I had previously examined. A Scottish specialist brought to me a case of what he believed to be malignant disease of the larynx for a second opinion. While I was inclined to fear that it might be so, I suggested a visit to Semon, who declared his belief that the well-marked diffuse and apparently

infiltrating thickening was probably an extreme instance of pachydermia, and would get well under rest and topical treatment, which it did. I was so struck by this diagnosis that I wrote to ask the mental process by which it had been arrived at, and, of course, received a very full and courteous explanation, with the substance of which, however, I need not now trouble you. Suffice it to say that this case impressed upon me both Semon's phenomenal power of observation, and how strongly he had the courage of his opinions, formed, as these were in such instances, on careful weighing of evidence, drawn from his rich store of experience. My second case was that of a stout old gentleman who suffered from progressive hoarseness caused by a sessile growth on one vocal cord. While want of mobility was not marked, I much feared that the condition was malignant, but desired to have the opinion of Semon. I forget the exact words of his letter, but the gist of it was that he did not think it was malignant, but that he had once had a case like it which turned out to be tuberculous. When I removed the growth the microscope confirmed his opinion. Not only in laryngology, but also in other branches of medicine, we find men who have great knowledge but cannot apply it, and we also find those who are most meritorious observers but fail to generalise from what they have seen. The explanation of such instances is difficult, but we may perhaps make shift by saying that the *mens medica* is wanting. This medical mind Semon possessed to an unusual extent. He seemed to have the faculty of rapidly applying all his own wide experience as well as what he had read to be the experience of others to any given case. To sum up, then, one of the elements of his success as a consultant was to be found in his great knowledge both of general medicine and of laryngology, combined with the gift of keeping the results of his experience fresh in his memory, so that all could be instantaneously applied to the proposition in hand.

While what has just been described would explain to a considerable extent Semon's success as a consultant, it is not sufficient to account either for his rapid rise to prominence nor for the unique position he attained in his specialty at a comparatively early age. We all know of gifted medical men who have had to wait for their harvest until their hair turned grey, and of others who, while seeming to possess every attribute required to ensure a rapid rise, have fallen by the way, often through no fault of their own.

While it is easy to speak of Semon's qualities as a medical man,

it is a less easy, and I might say a delicate task, to attempt an analysis of those other qualities which, while they assuredly did much—or perhaps I should say most—towards obtaining for him the position he occupied at the time of his retirement, are both difficult to define and still more difficult to classify.

I have known Semon intimately for so long that it is hard for me to imagine what would be my first impression of him if I were to meet him now for the first time. I should be struck, no doubt, by the keen intellectual face and the eloquent eyes, I should note the tense nervous energy, and if we talked I should recognise the well-informed man of the world, the great conversational power and the ready wit which shed interest on every subject it touched. If I met him first in a social gathering I should probably observe a tendency on the part of an ever-increasing number of those present to listen to his conversation, which he seems by a sort of instinct to be able to attune to the tastes of his audience—now babbling over with fun and humour, then again, if occasion require, gravely eloquent, and always well informed. We have, however, met others to whom most of this description would apply and who have yet failed to make their mark in the world; so that we must look for other qualities still. I think that perhaps one of these is to be found in the unusual combination of what I may term emotional impulsiveness with a cool head. Every action, every gesture bears the stamp of impulsive energy, and words often pour out as if spoken under the stress of emotion, yet the ideas they express are clear and logical and the facts they state are correct. I had known Semon years before I began to recognise this very unusual combination of emotionalism and accuracy in his character. It was in this way. We had been discussing the behaviour of a certain individual, and Semon, in his quick energetic way made certain statements impugning his conduct in what seemed to me unduly strong language. This I ventured to suggest, and at the same time hinted that without proof it was not safe to commit oneself in such a way. Imagine, then, my surprise when Semon produced from his safe these very proofs all carefully docketed for use if required. This incident suggests to me another phase in his character—a phase which unfortunately is not too common in our profession, namely, careful business habits. It may seem a small matter, but punctuality as to appointments and correspondence, careful recording of cases which have been seen, and retaining any letters to which subsequent reference may be required, are little matters upon which great issues may depend. In such things

Semon was always scrupulously accurate, so that he could turn up any case he had ever examined in his own house and at once find out all about it—for considering the amount of work he did his case-taking was wonderfully elaborate.

As I have said, in private discussion Semon gives the impression of impulsiveness. Curiously enough, in public speaking it is quite otherwise. Many, probably most of you, have heard him in debate, and must have been struck by the quiet, logical marshalling of facts which characterises his public speaking. There is little, if any, gesture, and every point is made by the pure force of logic. That he is a persuasive speaker and that both in English and German he occasionally reaches the higher flights of eloquence we all know, but in the main accuracy and cold relentless logic are the chief characteristics of his style.

Another great source of power is his, namely, his wonderful command of at least three European languages, and these the most important—English, German and French. Nowadays most of the younger consultants know at least one language besides their own, but in the days when Semon began to practise I fancy there were many leaders in the profession who knew little of any tongue save their own. I am not sure that this condition of matters did not remain longer with you in London than it did with us in the north, where the habit of visiting continental schools crept in earlier because, perhaps, of the impossibility of obtaining expert instruction in many specialties by any other means, while owing to the special and some of the more enlightened general hospitals the opportunity for getting information in most branches was provided in London. At the time he began to practise, then, Semon's linguistic talents must have been even more conspicuous than they would appear to be at present, although even now it must be admitted there are very few men in our profession who can attempt to equal him as a linguist. Of course this faculty of speaking and writing correctly three languages enabled Semon to reach larger audiences and to obtain a wider and more cosmopolitan circle of readers than would have been otherwise possible. As his earlier as well as his later work was beyond doubt of a very high order, the fact of his ability became more or less simultaneously recognised in different countries, and in this way no doubt he acquired a European reputation at an earlier age than he would otherwise have done. Again, he was thus able to keep himself abreast of all the progress which was taking place in laryngology and cognate subjects throughout the world without undue expenditure of time. Moreover without

his linguistic talents it is almost inconceivable that he could have made the *Centralblatt für Laryngologie* the success which it became practically from its inception.

This gift of languages may to some extent have developed to the perfection it reached owing to a natural aptitude, but we must admit that the seeds were sown during the earlier years of his life by careful education. Old and intimate friend of mine as Semon is, I have never been able to picture to myself how he was able to acquire the general erudition he displays in his writings. When I ask him he tells me that it dates from his school education. Yet those of you who have studied his published work must have been struck by his great general knowledge as shown by his quotations and references, both literary and historic. Here you will find a line from comic opera which precisely fits the context, there a saying of Talleyrand bearing exactly upon the situation, and anon will appear a paragraph from Schopenhauer, while perfectly apposite quotations from the classics of many languages abound. For a man to be able to carry so much of what he learned at school in his head and have it ready to reproduce as wanted is certainly a marvellous feat and a God-given faculty.

I do not know that I have often met with anyone who so thoroughly had the courage of his opinions as Semon. Among us this is not by any means a common trait, and not usually considered as making for success; nor is it often combined with tact. Yet I am not aware that when once asked for his views Semon ever hesitated to express them in the most unequivocal way, but always with a minimum of offence and always with what he believed to be a just appreciation of both sides of a question. As an illustration I may cite the masterly leading article from his pen which appeared in the *Centralblatt für Laryngologie* (1888) on the case of the late German Emperor. Many of you will remember the controversy which resulted from this case, and which for a time took on almost the character of an international question. Under such circumstances it was no small evidence of courage for a German practising in England to state his views so definitely, more particularly as in the main his article supported—and rightly supported—the position taken up by the German advisers of his late Majesty. It was also very characteristic of his meticulous honesty that in this same article he did not hesitate to criticise adversely and even severely certain aspects of the report by the side, to the support of which his conviction and logic led him. The same fearless spirit was also shown in his article entitled, "Some Thoughts on the Principles of

Local Treatment in Diseases of the Upper Air-passages" (*British Medical Journal*, November 2nd and 7th, 1901), where many of the abuses which had crept into laryngology and rhinology as a result of excessive zeal, too ready credulity, and from other causes which I shall not further specify, were freely criticised and forcibly condemned.

One of Semon's strong points, without doubt, is a very remarkable talent for organisation. This was never displayed to more advantage than in the very perfect way in which all the arrangements for the celebration of the one-hundredth birthday of Manuel Garcia were carried out. All of you who were present at this function will remember how smoothly everything went, and what an enjoyable reunion was provided by the ceremony which did honour to the inventor of the laryngoscope. Probably you will not disagree with me when I say that on this occasion even perfect organisation would not have been followed by such complete success had there not been also present in the organiser a keen appreciation of artistic effect.

Up to this point I have dealt with those qualities which, so far as I have been able to analyse the causes of a more than usually successful career, have seemed to me in some measure to account for Semon's rapid rise to prominence and fame. Let us now glance for a moment at the lighter side of his character, and in doing so we may perhaps pause to consider whether that same lighter side was not also a powerful influence in his career.

We all know that he is a very accomplished musician, and most of us are aware that he is a composer of some note. At times he must have found his knowledge of music very useful in his practice, although he probably values it more as an artistic gift to which he can turn for relaxation, and with which he is enabled to give much pleasure to others. If, however, as I suspect may have been the case, his musical talents formed the first link in the chain of love which binds him to his charming wife, whose glorious voice most of you have heard, then indeed he has much cause to bless these talents.

With regard to pleasures and pursuits of a less artistic kind, Semon is many-sided. He is an ardent devotee of field sports, more particularly deer-stalking and fishing, while his fine gift of horsemanship makes him at home in the hunting-field. He enters with pleasure into indoor games and plays an excellent rubber at bridge. Beyond all, he does these things with an almost boyish zest and keenness. You may say that these matters are too small,

too frivolous, to be introduced into a lecture which is supposed to be scientific, but if you say so I cannot agree. In this first lecture I have endeavoured, so far as may be, to dissect the character of the man in whose honour the lectureship was founded, and these apparently small matters have no doubt had their effect upon his career. One very special reason, however, there is for mentioning them. While excessively fond of music, field sports and many other pastimes, no one can truthfully say that Semon ever allowed any one of them to take up time which he felt ought to be given either to practice or to scientific work. The great success he attained in the former, the painstaking care with which he investigated his patients' ailments, the elaborate notes he took of every case of importance he saw, and the number and value of his published works, prove, if further proof were needed, how well he was able to map out his time to the best advantage. In this respect he has given us an example which is well worthy of imitation, not only by those whose aim is a medical career, but also by all, whatever be their profession or business. How frequently do we meet clever doctors whose knowledge of their own work is irreproachable, but who seem unable to take an interest in topics other than medical, able lawyers who talk volubly and well of law and cognate matters, but whose conversation is always straining back to things legal, and business men of acknowledged repute who can with difficulty assume even the *rôle* of good listeners if the talk be not connected with financial or commercial affairs. It is the tendency of the age to specialise, and as the struggle for existence becomes keener it grows more and more incumbent upon each individual to do the best he can for himself, be it in a profession or in commerce. Many men with this aim before them devote all their energies, all their thoughts, and all their brain-power to their work, and as a result lose touch with the world outside of that which it embraces. I cannot but question whether this can ever be the best road to success, for it stands to reason that the brain, like the body, must have a rest such as is given by taking the mind periodically away from that which tends to absorb it too absolutely. On health grounds alone it is, then, probably better for a man to cultivate pursuits with which he can occupy his leisure thoughts, and it is certainly desirable that he should take pleasure in some form of recreation which entails exercise in the open air. There are, however, other reasons why too complete absorption in work is undesirable. People who think only of one thing grow sooner or later intensely narrow in their outlook,

and as a result they are very liable to become most uninteresting companions to those whose thoughts are cast on different lines. Thus a vicious circle becomes established, for while they are inclined to shun those who do not take an interest in their own special department of knowledge, their acquaintances tend to avoid them as bores. In this way, keeping more and more along the narrow path of their interests, such one-ideal people are removed from the mental stimulus supplied by the world at large, and I venture to think in many cases tend to lose their mental acuity as a consequence. I have ventured upon this digression that I may again emphasise the excellence of Semon's example in this respect. It would not be easy to find many men who have done more work or better work in their profession, nor would it be easy to find many who coincidently with a busy professional life have enjoyed a greater variety of wholesome pleasures. It shows how much can be done if only a man has the gift of method in arranging his time-table, not only for the day, but also for the year. The number and variety of his pursuits no doubt largely contributed to making Semon the clever and amusing conversationalist we all know him to be. Towards this, of course, his wonderful memory, and, above all, his very strong sense of humour, largely contributed, but I much doubt whether these would have long survived on an exclusive diet of laryngology and cognate matters. We must, therefore, arrive at the conclusion that this wide sphere of interests contributed largely to the production of an interesting and sympathetic personality. Moreover, it undoubtedly was closely associated with the ability to throw off for a time completely the cares and worries of life, and to enter into sports and pastimes with an almost juvenile abandon, which, to those who know him intimately, is one of Semon's many charms. To young and ardent workers, then, I would suggest that they, too, should cultivate tastes and pleasures outside of their professional duties, provided always they keep them within proper bounds.

No doubt all look forward to a period when they may rest from their labours, and even if they do not contemplate the arrival of this period with agreeable anticipations, they must know that as they get older the choice will eventually be theirs no longer. When this time comes thirce happy are they who have prepared for it by providing wholesome and harmless pleasures, which will enable them to pass their time pleasantly, and above all to take a wide interest in the doings of their fellow men.

Semon retired at a comparatively early age, and in the zenith of his success, and here, too, it seems to me that he has set an excellent example to those who are in a position to profit by it. There are in all specialties, but more particularly in those which are of comparatively recent growth, periods which may be termed critical. In laryngology there have been various minor crises, if I may be allowed the term, but latterly the development which was heralded by bronchoscopy, and which includes the perfecting of direct laryngoscopy, œsophagoscopy and gastroscopy, has necessitated the acquiring of a new technique for those of us who have worked under the old *régime*. When such a critical time arrives the conscientious specialist has to decide whether he shall take the steps necessary to perfect himself in the newer methods, retire from practice, or hand over the care of patients requiring such methods of manipulation to a younger man. It may have been that some such ideas influenced Semon in his decision to give up practice when he did, but certainly the event occurred coincidentally with the general adoption of many novel methods. Whatever may have been the influences which led to this momentous decision, they found Semon prepared, and herein we have another example of the providence and forethought which regulated his life and work.

I have thus endeavoured to give an outline of a very remarkable career, and have made, I fear, a somewhat inadequate attempt to isolate and analyse the various qualities of the man which contributed to the attainment of the very outstanding position he held, and still holds, among the laryngologists of the world. Since withdrawing from active practice Semon has published two volumes in which are collected his chief contributions to laryngology, and at our next meeting I propose to consider their effect upon its status and science, but before I conclude to-day may I be allowed to draw a moral.

Briefly and with many flaws I have thus sketched in outline the rise of a man in a foreign country from a position of complete obscurity to the highest honours obtainable in his profession. He was not assisted by any outside influence, but had to rely entirely upon his own initiative and brain-power. Yet he retained a simplicity and charm of manner, and, what is more, of character, which is rarely found among men who have had to fight for their own hand and who have come victorious out of the struggle. Like other successful men he may have made enemies, but he has many loyal friends, not a few of these among his younger *confrères*, some

of whom have been much indebted to him for advice and encouragement, and to those he, in his turn, has been chivalrously loyal.

He has fought many battles with word and pen, but I do not think that anyone, be it friend or foe, can accuse him of ever hitting below the belt. His whole career has been characterised by the most scrupulous honesty of action and of purpose, thus affording a most excellent object-lesson that, at least in our profession, "Honesty is the best policy."

DIFFUSE OSTEOMYELITIS FROM NASAL SINUS SUPPURATION.

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(Concluded from p. 84.)

Treatment.

Prophylaxis.—In the event of an acute sinusitis with external swelling, immediate operation and drainage of the sinus are imperative not only to relieve the pain and general symptoms, but also in order to lessen the risk of diffuse osteomyelitis.

In discussing the prophylaxis of post-operative osteomyelitis, it must first of all be remarked that experience of this disturbing sequela has led, within the last four or five years, to a complete revision of the indications for operation on the frontal sinus. Caution and hesitation have replaced the eagerness and boldness which formerly prevailed, and few surgeons of prominence now make a rule of operating upon the frontal sinus solely because there is a purulent discharge from the cavity. The uncertainty of complete cure and the danger of osteomyelitis have conspired to reduce the number of these operations within recent years, and the pendulum has now swung back to the position so steadfastly and consistently maintained by Hajek, that in quiet and uncomplicated frontal sinus suppuration only intra-nasal treatment is justifiable. It is felt that a major operation should not be performed for a minor malady. This change affects the Killian no less than the Ogston-Luc operation.

As to the comparative risks of the two operations, the Killian and the Ogston-Luc, the opinion expressed by Luc is that the former is the safer for two reasons; first because the better

exposure in the Killian operation reduces the chances of blindly damaging the cribriform plate, and so lessens the risk of post-operative meningitis; secondly, because the subsequent freer drainage of the opened frontal sinus must also reduce the danger of post-operative osteomyelitis.

With Luc's first reason the facts are in full accord. Since the general adoption of the Killian operation accidental injury of the cribriform plate and consequent early post-operative meningitis have become less frequent. But Luc's second contention, that osteomyelitis is less likely to result, is, in my opinion, not yet firmly established. Luc, quoting his own experience, states that in his "first period" he had five cases of fatal intra-cranial complication, one of them being a case of osteomyelitis; while in his "second period" with double the number of operations he had no accidents at all. The total number of his operations is not given in the paper I referred to, but that the Killian operation has been followed by osteomyelitis the experience of other operators, including Killian himself, abundantly shows. As to whether osteomyelitis is more liable to follow the Ogston-Luc or the Killian operation I am unable from the cases hitherto reported to form a decided opinion.

Arguing *à priori* it is true that in the Killian operation the drainage of the sinus is more free and efficient, and for this reason one would anticipate fewer cases of post-operative osteomyelitis. On the other hand, the trauma is more severe; the amount of bone surface and the extent of raw bone edges exposed to the infection are greater than in the older operation.

In any case, the tendency of late years, a tendency encouraged by Killian himself, is to avoid external operation altogether in simple acute sinusitis and to secure the best possible intra-nasal drainage; and, in acute sinusitis with peri-sinus abscess, to be content with simple opening of the abscess and the sinus, followed by external drainage until the inflammation subsides.

Further, even in cases operated on *à froid*, Cauzard and many other recent writers postpone suture of the external wound for at least forty-eight hours.

Another detail in the technique of the radical operation upon which great stress is properly laid is to lessen the chances of secondary infection by removing disease in, or at all events by securing free drainage of, all other sinuses—ethmoidal, sphenoidal, and maxillary—which happen to be the seat of suppuration.

Further, in dealing with the affected frontal sinus itself—and the same applies to the maxillary antrum—forcible curetting

of the walls of the cavity should be avoided. In this connection an observation made by Lermoyez deserves to be quoted in full, especially as it seems to throw some light upon the genesis of post-operative osteomyelitis:

"I am perfectly convinced of the harmful effect of the curette, for in almost all frontal sinuses I have opened for the first time I have found the cortex white and healthy; while, on the other hand, in operations for recurrence I have found the same wall *red, friable, and attacked by diffuse osteitis*" (italics mine). "It is, no doubt, necessary to cleanse a fungating frontal sinus thoroughly, but it is also important to recognise that the curette should be used with the utmost gentleness, for our object is to remove the fungosities and not to scrape the bone."

In concluding our summary of the prevention of post-operative osteomyelitis we must not omit to mention that one of the advantages claimed by Watson-Williams for his osteoplastic operation is that by this method the nutrition of the bone-flaps is preserved, and the tendency to osteomyelitis is thereby lessened. This surgeon has not lost any of his cases from osteomyelitis, and the experience of Charters Symonds in performing the operation successfully upon a patient who had recently suffered from diffuse osteomyelitis may be cited in its favour. Up to the present time, however, the number of cases operated on by the osteoplastic method is insufficient to enable us to estimate its value.

There are a few rhinologists whose prophylaxis of osteomyelitis consists in not operating externally upon the frontal sinus at all. This attitude is, however, untenable in the face of any threatening general or local phenomena dependent upon the sinus disease. So long as the symptoms consist in nothing more serious than the discharge of a little pus, then the maintenance of intra-nasal drainage is all that is necessary, as we have already said. But when satisfactory nasal drainage cannot be secured or continued, and when such symptoms appear as persistent headache, vertigo, loss of memory, local pain and tenderness, peri-sinus abscess or fistula, and above all, when indications of intra-cranial mischief manifest themselves, then abstention from operation is pusillanimous.

Curative Treatment.—Once progressive osteomyelitis has set in, the only chance of saving the patient lies in the immediate and entire removal of the diseased bone. We can scarcely hope to cure diffuse osteomyelitis by simple drainage, hence limited and partial measures, such as incisions, trephining, etc., are useless. As soon, therefore, as cedematous swelling of the soft parts appears, the sinus must be opened, or, if operation has been performed, the wound must be re-opened forthwith, and a search made for pericranial abscess

and discoloration of the bone. If these indications of osteomyelitis are found, the whole thickness of the bony cranium must be entirely removed down to the dura, even when the vitreous appears to be healthy. Further, the superficial area of the bone resected must



Fig. 4.—Stereoscopic photograph of a case of osteomyelitis (under Dr. Walker Downie's care). Female, aged twenty-eight. Osteomyelitis spontaneous (syphilitic) in origin. The disease began in the ethmoidal region and induced necrosis of the frontal bone. Note sequestrum (held by forceps). Duration of illness two years. Recovery.

exceed the obvious limits of the disease. Intervention must be comprehensive; resection must be radical. In doubtful areas it is safer to remove bone than to leave it, so that in all cases removal should be carried wide of the disease. The sacrifice of large sections of the bony cranium need arouse no apprehension, for if the case recover the defect will be made good by osseous regeneration.

Certain details in technique should receive attention. Efforts should be made, for example, to prevent the transference of infection. Thus, when we come to cut through the bone beyond the limits of the obvious disease, and where it seems to be healthy, the forceps and other instruments employed should be newly sterilised, and the fresh edge of the resected healthy bone should be touched with phenol or hydrogen peroxide, or powdered with iodoform. As a precaution against further extensions, a series of small trephine-holes might be drilled through the healthy bone some distance from its margins with the object of relieving tension. The removal of the strip of apparently healthy bone beyond the obvious limits of the disease is advisable in view of the pathological fact that the bacterial invasion is always in advance of the naked-eye signs of the disease.

An instance of the amount of bone that may be safely and successfully removed is shown in Fig. 4, and we may also quote the case shown before the Laryngological Section of the Royal Society of Medicine in 1911 by Charters Symonds, in which the frontal bone, part of the roof and inner wall of the orbit, and the orbital ridge were entirely removed. Not only did the patient recover, but after a time the greater part of the frontal bone was regenerated and "the elevation of the forehead was restored."

Wheresoever the disease has spread, there must the surgeon follow it, and its further advances must be forestalled and countered by the measures we have suggested.

Failing these there is little else to be done. Schilling has suggested, in desperate cases, the cutting of a linear gutter across the bony vault of the cranium from one temple to the other. Unfortunately this attempt to "ring" the disease, as woodmen ring a forest fire, would only be partial. The route to the vulnerable base of the skull would still lie open to attack.

The use of vaccines and antitoxins suggests itself, but these remedies would be valueless if the diseased bone were not first removed.

Conclusion.

Our discussion of diffuse osteomyelitis secondary to nasal sinus suppuration has taught us that sinus osteomyelitis is a septic disease set up by a relatively heightened bacterial virulence, following operation or acute infection, the ultimate determining cause of which is unknown.

Until we unveil that hidden factor in its ætiology each time we operate on the frontal sinus we shall do so wanting the full and comfortable assurance that mastery of all the natural eventualities of the situation alone can confer.

In addition to the authors whose writings I have freely quoted, I desire to express my most grateful thanks to Dr. Andrew Wylie for kindly granting me permission to publish the notes of his case of diffuse osteomyelitis secondary to maxillary antrum suppuration; to Dr. Walker Downie for the use of the valuable photograph reproduced in Fig. 4; to Mr. E. D. Davis for the notes on his case (hitherto unpublished); and to Sir StClair Thomson, Dr. Logan Turner, Dr. Scanes Spicer and Mr. Charters Symonds for their kindness in supplementing by private communications the published reports of their respective cases. (The notes of Dr. Logan Turner's case are now published for the first time.)

APPENDIX.

Note.—Dr. Scanes Spicer's case.

This case, which is quoted by Gerber and Luc as one of septic osteomyelitis, proved to be a case of syphilitic bone disease of the frontal bone. The patient was shown before the Laryngological Society of London in 1904. The frontal sinus had been operated on and found to contain pus. The pathologist reported that the diploë contained granulation-tissue but no pus.

A few months later the swelling in the bone recurred. On this occasion anti-syphilitic treatment led to the rapid disappearance of the disease. The patient was then shown before the Laryngological Society in 1905, and the diagnosis of syphilis recorded.

Dr. Scanes Spicer has kindly informed me that a third appearance of the swelling took place a year or two later, and again it yielded to anti-syphilitic treatment.

CASES.

(1) LOGAN TURNER.—Male, aged thirty. "Frontal, ethmoidal and antral suppuration (right side). Discharge for several years. Had had Ogston-Luc operation twice on frontal by two different operators. When seen by me had an eyebrow fistula and some œdema of soft parts. Did complete frontal operation, removing bridge as well as floor and anterior wall (before the days of Killian). Cured ethmoid and opened antrum.

Duration of fatal illness, three months. Repeated scalp abscesses and removal of practically whole of frontal bone at successive operations; pus between bone and dura mater.

Death from pyæmia—abscess round rectum. No sectio. Never any definite signs of meningitis or brain abscess.

Definitely spread from frontal sinus; always a possibility that the osteomyelitis had commenced before radical operation."

(2) VAN DEN WILDENBERG (Antwerp).—Female, aged twenty-three. At the

first examination bilateral fronto-ethmoidal sinusitis was found, with acute symptoms. Endo-nasal operation. Recurrence. Killian radical operation on left side. Three weeks later swelling with fluctuation in the region of the right orbit. Radical operation on this side refused by patient. Simple incision at the inner angle of the right orbit. Pus evacuated and a small sequestrum of the os unguis removed. Fourteen days later extensive operation on this side and a large sequestrum, involving the crista galli and the lamina cribrosa of the ethmoid, removed. In the frontal region a very extensive zone of osteomyelitis discovered. In three days focal symptoms—motor aphasia, paralysis of the right hand—led to trephining, and an extra-dural abscess was drained. Symptoms unrelieved, and twelve hours later a brain abscess was opened. Coma. Death.

The osteomyelitis originated, it was thought, in the wall of the right (non-operated) frontal sinus, which showed signs of osteitis.

(3) VON EICKEN.—(Sex, age, and dates not given). Right antrum opened. Submucous resection performed. Radical operation on right frontal sinus, ethmoidal and sphenoidal cells. Primary suture, wound reopened later. Extending periostitis and osteomyelitis. Abscess in frontal lobe, opened and drained. Meningitis. Death.

(4) VON EICKEN.—(Sex, age, and dates not given). Frontal sinus and ethmoidal suppuration. Acute symptoms after accidental traumatism. Operation. Extensive necrosis of bone in region of left lachrymal, ethmoidal and frontal bones. Repeated operations. Meningitis. Death.

(5) WOLFF FREUDENTHAL.—Male, aged twenty-five. Influenza followed by headache and nasal discharge. A fortnight later swelling over right eye. Temperature 102.5° F. Fluctuation over right frontal sinus. Operation: Bone above and external to frontal sinus discoloured and covered with bloody patches. Bone removed 3 cm. up and 2 cm. out from the frontal sinus. Extra-dural abscess evacuated. Symptoms unrelieved. Second operation: Brain abscess found and evacuated (100 c.cm. pus). Recovery in six weeks.

(6) CHARTERS SYMONDS.—Male, aged thirty. The infection followed chronic suppuration of both frontal sinuses, and existed before operation. In a series of operations the frontal bone was removed together with a part of the sphenoid, the roof of the right orbit and its inner wall and the orbital ridge. On the left side part of the orbital ridge was left. Recovery.

The greater part of the frontal bone was reconstructed with the consequent restoration of the elevation of the forehead. On the left side the frontal sinus has been operated on by the method of Watson Williams, with no perceptible scar.

(7) DAN MCKENZIE.—Female, aged twenty-eight. Frontal sinusitis treated endo-nasally for two years. Autogenous vaccine (*Staphylococcus albus*) tried; no effect on discharge. Ten years previously operation on left maxillary antrum. Followed by prolonged illness with swelling of face; sequestrum involving part of lower edge of bony orbit removed. Recovery.

After X-ray photographs, Killian radical operation on May 7, 1909. "Bridge" cracked accidentally. Temperature normal, and skin-wound united in a week.

May 14.—Some pain, and small abscess in wound lips (? stitch abscess) opened. May 15.—Swelling and tenderness over bridge of nose. Temperature 101° F.

May 28.—Operation; wound reopened. Bone exposed at former operation white and necrosed; removed. Sub-pericranial abscess over frontal bone evacuated. Nasal bones white and necrosed; counter-opening made on right side of nose.

May 30.—Fresh autogenous vaccine (*Staphylococcus albus*) prepared and used regularly. June 1.—Eyelids on left œdematous; some chemosis and protrusion of globe; œdema over left temple. June 3.—(Edema of right eyelid. Temperature 102° F. Sleep disturbed. June 4.—Abscess under temporal fascia opened; pus found deep under orbital roof. June 7.—Meningitis. Temperature 105° F. Lumbar puncture; cerebro-spinal fluid turbid, contains leucocytes; no bacteria on culture. Operation.—Frontal bone trephined 1½ in. above right frontal sinus. Diploë apparently healthy. Granulations on dura, but no extra-dural pus. Exploration of frontal lobe negative. ‡June 9.—Coma. Death. *Post-mortem*.—Basal meningitis; infection seemed to have reached meninges by extension of suppuration back under roof of orbit. Osteomyelitis of lower frontal and temporal bones and orbital plate of frontal.

(8) ANDREW WYLIE.—Male, aged 29.

Admitted July 12, 1912. Discharge from left nostril of two years' duration. Transillumination and puncture showed pus in left antrum.

July 18.—Caldwell-Luc operation on left antrum. Mucous membrane polypoid. Operation uneventful.

Discharged a week later. Antrum washed out shows little or no pus.

August 3.—Re-admitted with pain and swelling of left side of face of four days' duration. Œdema of left lower eyelid. Temperature 103° F.

August 8.—Incision below left eye just beneath lower margin of orbit. Pus evacuated from subperiosteal abscess of orbital floor. Bare bone felt on probing.

August 10.—Chemosis less, pain less. Temperature 101° F.

August 27.—Dead bone removed from lower margin of malar bone. Temperature 98° to 100° F.

September 12.—Large sequestrum, loose, involving part of bony floor of orbit, malar bone with malar foramen, removed.

September 17.—Bare bone felt in ascending process of superior maxilla. Temperature 100° to 101° F.

September 19.—Left optic disc somewhat congested. Temperature about 99° F.

September 22.—Headache, but no signs of meningitis. Temperature 100° F.

September 29.—Marked increase of proptosis in right eye with œdema of eyelids. ?Cavernous sinus thrombosis. Delirium.

September 30.—Death.

Post-mortem.—Purulent osteomyelitis of frontal bone. Extra-dural abscess over frontal lobe. Pus in cavernous, transverse and circular sinuses extending to petrosal sinus on each side. No brain abscess. No meningitis.

(9) WALKER DOWNIE.—Male, aged thirty-six. Nasal polypi removed six years ago. Purulent discharge from nose for years. December, 1910, swelling in middle line of forehead midway between root of nose and edge of hairy scalp. Slow increase in size of swelling; not painful. Pressure on it caused pus to come into both nasal fossæ, especially into right. February 8, 1911, operation, necrosis of outer table of frontal bone found and eradicated.

(10) E. D. DAVIS.—Female, aged twenty. 1908.—Left frontal sinus opened; Ogston-Luc. 1909.—Sinus re-opened. August, 1910.—Killian radical on left frontal sinus; œdematous middle turbinal removed; left antrum opened. A few days later right antrum opened under cocaine. Five weeks later, discharged well.

January, 1911.—Returned with subcutaneous abscesses of the scalp and frontal region. Abscesses opened and carious bone found. Two injections of staphylococcus vaccine tried; no obvious difference. Wounds healed. Patient discharged well.

Addendum.

Since the above article was written I have found an allusion to osteomyelitis in "Nasal Polypus," by the late Edward Woakes, which, in view of the early date of the remarks (1887), I quote in full. Speaking of the tendency of ethmoidal disease to involve the orbital wall, he says (p. 24):

"Instances are reported, though their occurrence is rare, in which abscess of the orbit, with or without consecutive necrosis of the frontal bone, followed by fatal meningitis, has accompanied the advance of the disease in this direction."

BIBLIOGRAPHY.

SCHILLING, R.—"Ueber die Topographie der Diploë im Stirnbein," and "Ueber die Osteomyelitis der flachen Schädelknochen," etc., *Zeitschr. f. Ohrenheilk.*, xlviii, 1904.

RÖPKE.—"Osteomyelitis des Stirnbeins," etc., *Verhandl. d. Deutsch. Otol. Gesellsch.*, 16 Versamm., 1907, p. 162.

GERBER, P. H.—"Die Komplikationen der Stirnhöhlenentzündungen," S. Karger, Berlin, 1909.

LUC, H.—"Complic. Craniennes, etc., des antrites frontales suppurées," *Annales des Maladies de l'Oreille*, etc., xxxv, 1909, p. 3.

KILLIAN.—"Die Thrombophlebitis des oberen Längsblutleiters nach Entzündung der Stirnhöhlenschleimhaut," *Zeitschr. f. Ohrenheilk.*, xxxvii, 1900, p. 343.

KATZ, PREYSING and BLUMENFELD.—"Handb. der Speziell. Chirurgie," etc., Würzburg, 1911-12.

GUISEZ.—*Bulletins et mémoires de la Soc. franç. d'Otol.*, etc., tome xxv, 1, 1906.

LUC, H.—"L'ostéomyélite des os plats du crâne," etc., *Annales des Maladies de l'Oreille*, tome xxi, No. 5.

CANON.—"Beitrag z. Osteomyelitis mit Immunisirungsversuchen," *Deutsch. Zeitschr. f. Chirurgie*, Bd. xlii, 96, p. 135.

HAJEK.—"Pathologie und Therapie der entzündlichen Krankheiten der Nebenhöhlen der Nase," F. Deuticke, Leipzig and Wein, 1909.

TILLEY, H.—*Lancet*, August 19, 1899, p. 534. *Edinburgh Med. Journ.*, March, 1905.

STCLAIR THOMSON.—"Frontal Sinusitis: Two Cases of Death after Operation." *Lancet*, August 12, 1905, p. 431.

SCANES SPICER.—*Proceedings Laryng. Soc. of London*, 1904-5, p. 12, and 1905-6, p. 13.

CHARTERS SYMONDS.—"Removal of the Frontal Bone for Septic Osteomyelitis," *Proc. Roy. Soc. Med.*, Laryngol. Sect., vol. iii, 1910, and *Journ. of Laryngol. Rhinol. and Otol.*, vol. xxv, p. 33.

WALKER DOWNIE.—*Journ. of Laryngol., Rhinol., and Otol.*, vol. xxvi, 1911, p. 374.

GREGORY, H. C.—"Acute Cerebro-Spinal Meningitis of Nasal Origin," *Journ. of Laryngol., Rhinol., and Otol.*, October, 1912, p. 538.

See also "Discussion on the Treatment of Frontal Sinus Suppuration," Laryng. Sect., Roy. Soc. Med., *Journ. of Laryngol., Rhinol., and Otol.*, vol. xxvi, p. 354 *et seq.*, and discussion at International Congress of Medicine at Budapest, Sect. Laryng. and Rhinol., *Journ. of Laryngol., Rhinol., and Otol.*, vol. xxvi, p. 378 *et seq.*

SOME DENTAL ASPECTS OF RHINOLOGY.¹

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THERE is a territory somewhat vaguely dividing the regions dominated by the rhinologist from those that are the sphere of the odontologist, and it is proposed in this paper to review some of the diseases of that territory which may arise from disturbances in the domain of the odontologist, but which may at any time, from one cause or another, lead to disturbances in that of the rhinologist. To rid the paper of the dryness inseparable from compilations from books, I have based it especially on my own clinical experience, although this somewhat limits its scope.

For convenience I will consider the subject under four heads, although they necessarily overlap—

- (1) Developmental defects.
- (2) Injuries.
- (3) Infections.
- (4) Tumours and cysts.

(1) DEVELOPMENTAL DEFECTS.

Ignoring cleft palate, which has but little practical interest for the rhinologist, I wish to draw attention to the very important question of under-development, anatomical and physiological, rather than to actual physical defects.

Structure and function are so inseparably associated that, as has been so well exemplified in problems in evolution, it is often difficult, and in many cases impossible, to say whether function, be it normal, or impaired, has been the result of structure, or whether structure has been the result of the degree of functional activity exhibited; and so arise two opposing schools. Without wishing to take sides on the general question, I have no hesitation in emphasising the importance of full functional activity of the parts for the proper development of the oral cavity, nasal fossæ, and the pharynx. Not only so, but there is a great deal of evidence to support the statement that impaired oral function interferes with proper nasal development and *vice versa*, for one frequently finds that impaired function in the one region leads to impaired function in the other, probably by causing structural defects which

¹ Read at the meeting of the Scottish Otological and Laryngological Society, November 30, 1912.

involve both regions. This induced effect becomes itself the cause of other defects, and so a vicious circle is set up—just what one would expect when the common embryological origin and the proximity during growth of the two cavities is remembered.

To encourage the full development of the parts, then, we must insist upon efficient mastication and upon nasal breathing for the developing child. I have been preaching this for years, in season, and many people think out of season. I shall say only a word about nasal breathing, because it would be ridiculous to insist upon its importance here. I wish to remind you of only one factor in inducing mouth-breathing, because I think too little importance is attached to it—the position in which the infant is usually placed in its cradle or perambulator, with the head in a line with the body, or even extended. Now it is always easier to breathe through the mouth than through the nose, and this posture causes a drag on the mandible which tends to cause a parting of the lips, of which the infant at once takes advantage to get an easier air-way, and so the habit of mouth-breathing is established. An infant from the very first should have a pillow sufficiently high slightly to flex the head on the chest, in which case it will have to make a voluntary effort in order to part the lips, and the infant, finding it easier to breathe through the nose, does so.

The importance of efficient mastication during early childhood for the proper development of the jaws and accessory parts, as well as for the prevention of dental disease and its sequelæ later in life, is only now receiving tardy recognition. The milk teeth erupt into an arch already large enough for them. The permanent teeth develop in a very crowded condition, and unless the milk teeth are efficiently used and thereby preserved, the jaws are not sufficiently developed, and whether as an effect or merely as a concomitant, there is apt to be impaired nasal development, such as a deflected septum. If the jaws are developing normally, the milk teeth in the front of the mouth of a child between the ages of five and six should show marked spacing, and if this be not present, means should be adopted to stimulate growth at once.

When a child is weaned, it is usually put on to such a diet as bread and milk, mashed potatoes and gravy, porridge, and milk puddings. Surely if this were the proper diet for a child of ten months old it would remain edentulous, for what possible use can teeth be to prepare such food for digestion? Does not the fact that the child gets teeth indicate that these extremely hard and resisting structures should be used?

The front, sharp, cutting teeth appear first, and the back, chewing teeth much later. These front teeth are well adapted for two purposes—firstly, for stripping meat off bones, and secondly, for piercing ripe fruit, thus allowing the child to extract the juice. Hence, although milk must still be the main food of the child, it should be supplemented, not by the semi-fluid substances mentioned above, but by smooth-ended chop bones, rabbit or chicken bones, any of which will put the child into the seventh heaven of delight. Fresh fruit can also be given, especially sweet oranges, by holding a piece of orange from which the pips have been removed and allowing the infant to suck out the contents. Carbohydrate food may be added, but should always be in a hard, dry state, instead of being made sodden with milk or gravy. For this reason dry crusts, toast or rusks, with plenty of butter, should be given; and the child, being unable to swallow them dry, will exercise its jaws in chewing them until it has thoroughly insalivated them, and consequently the salivary glands will be developed, which they never are with the diet commonly given to infants. In the same way, instead of giving soft porridge deluged with milk, give the oatmeal in the form of dry oat-cake with plenty of butter, and let the milk be given separately. To sum up, at weaning, the food should be absolutely fluid, such as water and milk, so as to be drunk, or quite dry and tough, so as to necessitate mastication. Pap foods lead to the habit of “bolting,” to indigestion (for which “teething” is almost invariably, and quite wrongly, blamed), and to the undevelopment of the jaws, nasal fossæ and salivary glands.

At a later age a meal should never end with easily fermentable substances such as cake or jam. These should be scoured off the teeth with a buttered crust, toast or rusk, and the meal finished with *fresh* fruit, such as an orange, banana, or, perhaps best of all, an apple. The common practice of giving children chocolates the last thing at night is a prolific source of dental disease, ill-health and misery.

It is well known that the intermaxillary suture can easily be opened, and so the arch widened, by exerting lateral pressure on the maxillæ through the teeth, and this treatment has been adopted within the last few years with the object of preventing or curing a deflected septum nasi. The treatment is quite on its trial, and the problems involved are intricate and our knowledge of them very meagre. I need only refer to the need for early removal of nasal or naso-pharyngeal obstruction before it has produced deformities, and to the wholly beneficial effect of

breathing exercises and of a diet that absolutely demands mastication.

Another matter that hinges on development is the eruption of teeth into the nasal fossæ. It is uncommon, and the tooth is almost invariably a canine, but it is interesting as a possible cause of a unilateral nasal discharge. After certain operations for cleft palate, too, a tooth or teeth, usually a lateral incisor, may erupt inside the anterior nares.

(2) INJURIES.

I will confine myself to such as may arise from interference on the part of the dentist. In the first place, there is the possibility of the passage of a root into the maxillary sinus during attempts at its extraction, and the wonder is that the accident is not much more common when one considers the anatomical relationship and the pathological changes that so frequently occur in this region. To indicate its rarity, however, in a very large experience I have only met with two cases, one of which occurred in my own practice. On the other hand, I have had several cases sent me by dentists who have asserted that a root has disappeared into the maxillary sinus during attempts to extract it, but in every case but one, careful examination has proved that the dislocation was into a very large chronic abscess or into a cyst cavity.

Another and much more frequent accident during extraction is fracture of the bony wall of the maxillary sinus, a part of which may be dislodged, firmly adherent to the tooth or root. The involvement of the sinus may be indicated in several ways—by the water used to wash out the mouth passing into the nasal fossa on that side, by blood escaping by that route, and by the consciousness on the part of the patient that air is passing through the sinus. Probably the accident happens frequently without any evidence of it. Quite a number of cases have been referred to me, and I have throughout adopted an expectant line of treatment, and only in one has infection occurred, and possibly it was there at the time of operation. Probably in these cases the lining membrane is simply torn (for it is rare for any of it to be found on the fractured bone), so that the edges tend to lie together; and the blood-clot, which fills the socket, and which must be kept sterile, further protects the sinus from infection. I teach that where a piece of bone obviously involving the wall of the sinus comes away during extraction, the operator should not pass a probe or investigate in any way, but wait and see the result of careful antiseptic treatment,

which, however, must not include the syringing of the socket. Probably in many cases where the bony wall of the sinus is fractured, the mucous membrane is not torn at all, as it easily strips off—another reason for masterly inactivity. I have met with a case of uncommon foreign body in the nasal fossa—namely, the root of a tooth—where it had lain for nearly four weeks and had given rise to a good deal of inflammation and pain. The patient had had a number of roots extracted under chloride of ethyl and had afterwards vomited, some of the vomit escaping through the nose; and the root, which she had apparently swallowed, lodged in the left nasal fossa, whence it was expelled, with a copious flow of blood and probably pus, whilst the patient was blowing her nose.

(3) INFECTIONS.

I have met with a few cases of unilateral nasal discharge which have arisen in connection with abscesses of the incisors, all but one being from the central incisor on the same side as the discharge. Probably the pus travels along the canals of Scarpa or Stenson, as examination has shown the orifice of the sinus in each case to be about the position where they reach the nasal fossa.

In the one case associated with a lateral incisor the patient had been edentulous for many years, and I came across the case by happening to come into the Ear and Throat Department, Edinburgh Royal Infirmary, just when Dr. Logan Turner was examining her. There was discharge from the right nostril, and examination showed redness and tenderness in the region of the lateral incisor. I was asked to take over the case and a piece of root was removed. I then, at the request of the patient's employer, treated the case in private, and for some months could not get the sinus to heal. Eventually it healed at once by freely curetting the whole length of the sinus and then applying a ball of cotton-wool over the lip and left *alana*, and applying firm pressure with a bandage for four days.

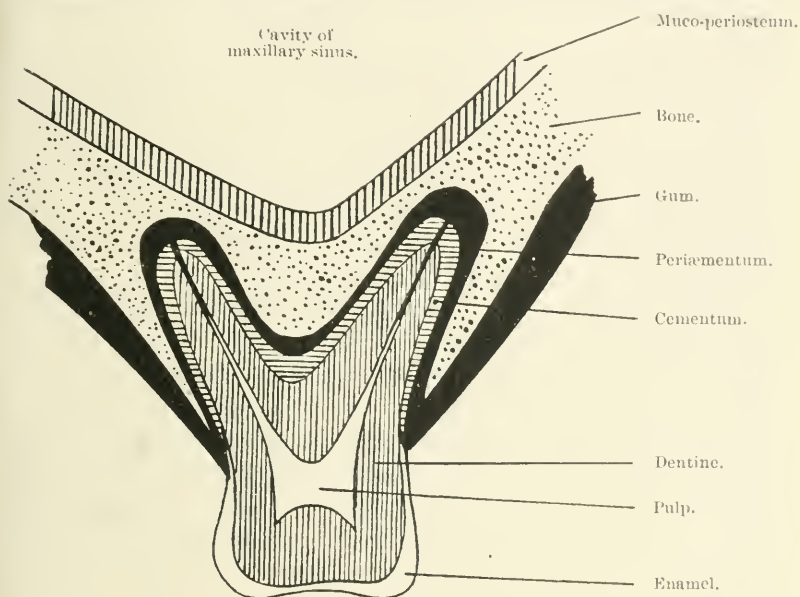
Considering the proximity of the cheek teeth to the maxillary sinus it is not surprising that infection should at times spread from them to it, and I think that it happens a good deal more commonly than some rhinologists are disposed to admit.

Apart from the results of injury, which have already been considered, oral sources of infection may be grouped under three heads: (a) dento-alveolar abscess; (b) pyorrhœa alveolaris; (c) infected cysts.

A dento-alveolar abscess involving the maxillary sinus is almost

always in connection with a molar, usually the first. Infection from teeth anterior to this becomes progressively rarer, so that, as far as I am aware, only one case is on record of an abscess in connection with a central incisor causing infection of the sinus.

For the purpose of the rhinologist the diagnosis of purely tooth conditions is not of much importance, for it is only after infection has spread to the periodontal tissues that the maxillary sinus can be infected from this source. Consequently it is important to adopt a definite order of procedure during examination,



and particularly not to palpate until after inspection. For purposes of inspection, a mirror, such as a laryngeal mirror, may be used, partly to hold out the cheek, partly to reflect light on to the teeth and gums. The crowns of the teeth can be examined first, and any cavities, especially any medium-sized or large ones, noted. Again, teeth with large fillings may be suspected. A crowned tooth has almost invariably lost its pulp, and so may be a source of dental infection. Now, if the tooth pulp is alive, there is practically no chance of that tooth being a source of infection; but it does not follow that one should suspect a tooth because it is pulpless, for, if the canals have been properly treated, the tooth is as far above suspicion as one with a live pulp. All the same, a tooth without a living pulp should be under suspicion until it has amply proved its innocence.

It is usually pretty easy to diagnose a live pulp; but it may be quite impossible without an operation, which a dentist only can perform. The temperature test, however, is one that the rhinologist can easily apply, and it is fairly reliable. A small bulbous metal instrument is heated in a spirit flame and carefully applied to the crown of the tooth, or, better still, to a metallic filling, if one be present. If the pulp be alive, and the heat be conducted through the tooth or filling to it, the patient will feel momentary pain. A positive result is conclusive, but a negative one is emphatically not. In order not to cause the patient unnecessary pain, the instrument should not be made too hot at first, but if there be no response, it can be made hotter and hotter until the end of it is nearly red-hot in the flame. Cold may also be applied to each individual tooth by holding a small tightly rolled pledget of wool in a pair of tweezers and dipping it into some highly volatile liquid, such as ether or ethyl chloride, and quickly applying it to the tooth to be tested, taking care that it does not run on to a neighbouring tooth; or a very small ethyl chloride spray may be used.

Note should be made of any tooth missing from the series, and inquiries made as to the reason for its absence. It must not, however, be too hastily assumed that because the crown is missing the whole tooth has been lost; for it occasionally happens that the root or roots may be completely buried under the gum, and moreover, that the gum over it may appear remarkably healthy. The buried root may also have a large chronic abscess, which perhaps only once in the course of several years gives any evidence of its presence by slight swelling or uneasiness. Usually, however, a minute sinus can be detected by means of a very fine probe.

Inspection of the gums may give very important evidence, and it should be remembered that the arches are bilateral, and that corresponding spots on the two sides of the mouth should be compared. The first and most obvious thing to look for is a sinus, which is usually situated about a quarter of an inch from the free margin of the gum. It is usually over the affected tooth, but not necessarily so.

If there be no sinus, any swelling on the gum should be noticed, and its colour at the same time, for there may be a blind abscess, and its centre will probably exhibit some congestion. Later on palpation may reveal fluid, but owing to the smallness of the abscess, fluctuation may be difficult to obtain. Of course, such a swelling may be a small cyst. Apart from any swelling, mere localised redness should be carefully noticed, as many blind

abscesses cause no swelling on the gum. Then the free margin of the gums should be carefully inspected, and any congestion, rounding over of the free edges, swelling or atrophy of the interdental papilla, and any tartar, especially the green variety under the free margin of the gums, noticed. A great deal may now be discovered by palpation and percussion. The firmness of the teeth in their sockets can be tested by the fingers. Any swelling can be tested for fluctuation, and any congested spot tested for hyper-sensitiveness by deep pressure with the pulp of the forefinger. If the gums are not healthy, pressure should be made towards the free margin with the pulp of the forefinger, and possibly a whitish exudate or pus, sometimes tinged with blood, may be squeezed out, especially between the two teeth, indicating a pyorrhœal condition.

Then each tooth can be gently percussed with a light instrument and comparison made between them. A tooth with chronic pericementitis will usually be distinctly more sensitive than one with a healthy pericementum, or the patient will detect that the sensation produced is different in the two teeth. Percussion should be performed on all the available surfaces of the teeth, as it may cause discomfort if applied in one direction, and not if applied in another. As to the value of this test, it is simply one for eliciting pericementitis, and does not at all determine whether the pericementitis, if present, is simple or infective. Simple pericementitis is very common and has no interest for the rhinologist. For all these investigations he would be wise to invoke the aid of the patient's dentist, who may also have a written record of any suspected tooth.

There is, however, another method of investigation available which would be of more value, especially to the rhinologist, than any I have so far considered, and that is skiagraphy, because a good skiagram indicates at once any abscess at the ends of the roots as well as any pyorrhœal condition spreading from the gum margins towards the apices, for from this condition, as well as from a dead pulp, an abscess may occasionally arise. Not only does the skiagram indicate the presence or absence of these conditions, but it also indicates their extent, and so its value cannot be overestimated. Of all skiagraphy, however, that of the teeth, especially those of the maxilla, is probably the most difficult, owing to their arrangement in a curve and to the impossibility of getting the photographic plate or film parallel to the length of the tooth. It is perhaps unnecessary to say that skiagrams for this purpose

taken through the head are quite valueless (with the exception of those taken from one definite position) and a film must be used in the mouth. The position of the tube is of prime importance, as a displacement of an inch one way or the other makes all the difference between a valuable and an altogether valueless picture.

The interpretation of these skiagrams is sometimes difficult, as the part about which information is particularly required—the pericementum—shows only as a fine line, and one wishes to know whether it is a continuous, separate line, or whether it runs into other lines, such as that caused by the floor of the maxillary sinus, or broadens out into a patch indicating rarefaction and probably an abscess. If the tube is not placed properly relatively to the position of the film in the mouth, it is very easy to get misleading results, such as the roots appearing to project into the maxillary sinus, when they do not really do so.

With regard to pyorrhœa alveolaris, I would like to point out that the organisms may spread through the cancellated bone and infect the maxillary sinus without there being any gross channel for infection to pass along.

Dental abscesses may be of very large size, and I have met with two cases where plugs had been inserted in the mistaken belief that the maxillary sinus was being dealt with.

The general indications for treatment of infections around the teeth are definite. Either the infection must be abolished, that is a "cure" brought about—and this can be done in nearly every instance in which the tooth is worth saving at all—or the tooth should be unhesitatingly prevented, by its immediate removal, from being any longer a source of great risk to the patient.

(4) TUMOURS AND CYSTS.

The consideration of this part of the subject, even in a very elementary fashion, would take too long, so I will confine my remarks to two very common cysts of dental origin which not uncommonly encroach upon the maxillary sinus.

By far the commonest cyst in man is the dental cyst. It is developed almost invariably in connection with a tooth or root that has a dead pulp, and the theory is that the absorption of toxins stimulates some epithelial remnant near the apex of the tooth to proliferate, and that the central cells undergo colliquative necrosis so that a cyst is formed, lined by several layers of epithelium, surrounded by a fibrous capsule. It must be only a comparatively

small number that reach a size sufficient to give them clinical importance, because histological investigation shows that up to the size of a pea they are extremely common.

They may, however, attain very large size, causing great destruction of the maxilla and invading the nasal fossa or maxillary sinus. In the case of the maxillary sinus the mucous membrane may be lifted up ahead of the cyst, which comes to occupy the position of the sinus, the cavity of which may be nearly obliterated. An interesting fact in connection with these cysts is that they are sometimes lined by very typical columnar ciliated epithelium.

The origin of the epithelial rests which give rise to these cysts may interest the rhinologist. Epithelial cells form the enamel, which thins out to nothing at the neck of the tooth. The margin of the epithelial cells, however, remains, as it were, tacked down to the growing part of the tooth germ, and the dentine grows up inside the epithelial sheath. The dentine, then, is at one stage clothed by two or more layers of epithelial cells, most of which, however, atrophy and disappear when the dental follicle erupts through them to coat the dentine with cementum, thereby uniting the tooth to the alveolus.

Some of the epithelium remains as small clusters of cells in the pericementum. These cell clusters or rests may not undergo further development, or they may proliferate, forming large "epithelial root tumours"; or, if they become cystic, they form dental cysts; or, if they calcify, they may form enamel nodules; or they may be the starting-point of a very insidious carcinoma of the maxilla.

The follicular odontome is the next commonest cyst of the jaws, and arises in connection with a complete but often deformed tooth. The fluid is formed over the crown of the tooth, and inasmuch as it was supposed to be between the follicle and the crown the name "follicular odontome" was given to it. It has since been discovered that the cyst-wall is usually lined with epithelium, whilst the enamel cuticle or layer of flat epithelial cells that normally clothe fully-developed enamel is absent. Consequently the fluid must, at least in many cases, be of epithelial origin, as it is formed inside the enamel organ, and so the cyst is really one form of the epithelial odontome. The follicular odontome may occur in connection with any permanent tooth, which does not then erupt, but is very rare with milk teeth. Extra teeth or supernumerary teeth are relatively uncommon, and cysts in connection with them are very rare. The only case I met with was referred

to me for diagnosis and treatment by Mr. Sanderson, L.D.S., and as it involved the floor of the right nasal fossa, and possibly the inner wall of the maxillary sinus, the case may be of some interest to the rhinologist.

SOCIETIES' PROCEEDINGS.

BRITISH MEDICAL ASSOCIATION.

Meeting at Liverpool, 1912.

SECTION OF LARYNGOLOGY AND RHINOLOGY.

JOHN MIDDLEMASS HUNT, M.B., *President.*

Abstract Report by MR. HAROLD KISCH.

(Continued from p. 88.)

Discussion on the Treatment of Chronic Suppurative Ethmoiditis.

II.—**H. Lambert Lack, M.D., F.R.C.S.** (Lecturer and Surgeon to Throat Department, London Hospital).—Suppuration in the ethmoidal cells is almost always accompanied by polypus, and frequently by suppuration in other accessory sinuses: also orbital or other external complications may be present.

Piecemeal Operations.—The methods of piecemeal operations through the nose under general anæsthesia I need hardly discuss, as I consider them both inadequate and dangerous. They belong to the older days of rhinology, before surgical experience had been brought to bear upon the subject, when the rhinologist was still too timid to employ general anæsthesia in operations involving bleeding in the nose, and was afraid of touching the ethmoidal region unless he had the patient sitting upright and could "see" exactly what he was doing. These "operations" required constant repetition; weekly or almost daily treatment, extending over two or three years, was necessary to produce even a "half cure." Patients would rarely submit to this, and the few who did were usually reduced to a condition of profound neurasthenia. Fewer still would admit that their nasal symptoms were improved, whatever might be the view of their enthusiastic physician. I am speaking only of extensive disease; when only one cell, such as the cell in the anterior end of the middle turbinate, is involved, a trivial operation with local anæsthesia is sufficient, but then only a single sitting is required.

Ethmoidal Curettement.—This operation still appears the best for most cases of ethmoidal suppuration. When there is extensive ethmoidal disease, and possibly also suppuration in other accessory sinuses, the operation which I have described as "ethmoidal curetting" should be carried out. It is well to pack the nose half to three quarters of an hour before the operation with a weak solution of cocaine and adrenalin, as it permits a better view of the parts, and the danger of reactionary hæmorrhage appears to be remote. A general anæsthetic should be given, and the patient should lie on his right side with the head slightly raised and

turned to face the operator, who sits on a stool by the side of the operating table and uses a reflected light, as in ordinary rhinoscopy.

If there is any suspicion of antrum suppuration the first step should be to explore that cavity, and if pus is obtained it is best to deal with it at once. In these cases I consider a radical operation on the antrum is necessary, and therefore proceed to remove the anterior end of the inferior turbinate and the whole inner wall of the antrum. The attention is then turned to the ethmoidal region. Any large polypi should be removed with forceps, Luc's forceps being probably the best, and the middle turbinate, if present, clipped away with Grünwald's forceps. Directly this has been done and the ethmoidal cell region exposed, the ring knife should be introduced. The curette should be introduced gently with the blunt edge of the ring towards the septum, and passed as far upwards and backwards as possible without using force. The blade is then sharply dragged horizontally forwards along the ethmoidal region with the sharp edge directed *outwards* towards the orbit. On no account should the cutting edge of the blade be turned upwards towards the cribriform plate. The scraping is continued rapidly and with a fair amount of force until all friable tissue is removed. A great deal of polypoid mucous membrane and bony *débris* is usually scraped away, and almost the whole of the lateral body of the ethmoid can be thus removed. Often it will be found that a large communication has been made into the upper part of the antrum, and frequently the inner wall of the orbit has been broken down and the orbital periosteum exposed.

As regards the ultimate condition of the nose, the results of the operation are excellent. The removal of such an extensive portion of the bones and mucous membrane rarely gives rise to any ultimate inconvenience to the patient. The upper portion of the nose becomes lined with a healthy white scar-membrane, and only occasionally is there any undue dryness or crusting in the nose or post-nasal space. So far from destroying the olfactory sense, the patient often regains the power of taste and smell, which he may have lost for years. In all cases the result is not so successful as this. There may be a continuance of suppuration or some remains of polypoid degeneration. Subsequent trimming away of tags under cocaine anaesthesia has been necessary. It must be borne in mind that a continuance of the suppuration may mean disease in other sinuses. The clearing away of the ethmoidal cells facilitates the diagnosis of this, for when the antrum has been explored and the ethmoidal region thoroughly curetted, pus coming down from high up in the front of the nose can only come from the frontal sinus, whilst pus at the back of the nose must come from the sphenoidal sinus, the ostium of which has been freely exposed to view by the removal of the middle turbinate and the posterior ethmoidal cells. In this connection one must also remember that the antrum, even if healthy before the operation, may become infected at or soon afterwards. In other cases where the disease has been very extensive and the operation for one reason or another not carried out so thoroughly as it might have been, a *partial success* may be obtained, and the patient's symptoms, such as pain, headache, and the sense of nasal obstruction, may be relieved, although the appearance of the nose may be anything but satisfactory. Lastly, there may be *adhesions*. These are due to injury of the septum during the performance of the operation, and they may usually be avoided by care at the operation and in the after-treatment. The use of cocaine and adrenalin, as above described, diminishes this risk. *The dangers of the operation* I wish to consider fully.

(1) *Mortality*.—In my own practice, in over 300 cases I have had one death. This was due to neglect of the precautions which I have above emphasised. The case was one of chronic ethmoidal suppuration associated with asthma; the patient took the anæsthetic badly, was somewhat congested, and bled freely, so that it was impossible to see what was done. The middle turbinate and ethmoid seemed unusually dense, and the curette produced very little effect. Too much force was used, and the blade of the instrument was turned upwards. The patient developed meningitis, and died a week later. In the reports which I have had from eleven different operators, eight state that they have had no deaths; the other three report six deaths. From a study of the details I should say most of the deaths were avoidable. Two cases, both young girls, did well until the fifth day. They were in wards which were unusually septic at the time, and one was dressed by a house-surgeon suffering from a septic throat. Two of the others were old people over sixty, their noses were widely distended with polypi, and they had had growths removed for over thirty years. One of these cases apparently died from traumatism, a cribriform plate which was very brittle being fractured; the other died of sepsis. All the deaths were due to meningitis; I have heard of no death from any other cause. In considering these results, it must be borne in mind that the operation is a serious one, but it should only be carried out to cure an undoubtedly serious and incapacitating disease, and therefore some risk is justifiable. Also remember that these statistics date from the earliest days of the operation before any experience had been gained, and whilst some surgeons considered it an absolutely safe procedure and therefore neglected the precautions which we now know to be necessary. With regard to age, I used to confine the operation to patients under forty years, and would still hesitate to operate on people over fifty. Between forty and fifty each case may be judged on its merits; there can be no hard and fast age limit. As age increases the ethmoid becomes more brittle, and there is more danger of fracture of the cribriform plate, and the patient is less able to stand the loss of blood, the shock of the operation, and the complications arising from blood entering the air-passages.

With these precautions I think the risk could be reduced to less than 5 per 1000; it would certainly not be a tenth of the mortality of operations on the frontal sinus. There is no alternative method giving anything like such good results with so small risk.

(2) *Septic Troubles*.—In some of my early cases there was considerable fever two or three days after the operation. This rise of temperature almost certainly arose from packing the nose. For many years I have given up this practice, and the after-treatment has consisted in gently irrigating the nose daily with a mild, unirritating lotion, such as warm boric acid solution. Since then I have had no trouble with fever. Some advocate the use of vaccines preparatory to the operation, and think the absence of fever subsequently may be traced to this. These views are open to discussion: I am not convinced of their correctness, and would not, with our present knowledge, advocate vaccine treatment.

(3) *Hæmorrhage*.—Bleeding is often profuse at the time, but rapidly ceases. Only once or twice has it been necessary to pack the nose for this reason. Should the bleeding really be severe and not yield to simple remedies, such as the application of cold to the face, then the nose must be packed, and I would recommend the introduction of strips of gauze into the ethmoidal region. These should be removed twelve to twenty-four hours later, and not replaced unless again required.

(4) *Orbital Complications.*—When the orbital plate has been removed or fractured and the periosteum exposed, there may follow some effusion into the orbit or a severe "black eye" may be produced, occasionally with some pain or impaired mobility of the globe. In two cases where ethmoidal disease was associated with antrum suppuration an abscess formed in the lower eyelid. All the other cases of "black eye" have passed off in a few days without subsequent trouble.

(5) In one case privately reported to me and published in my book, and in another published by Robinson, of Brisbane, optic neuritis and blindness have followed the operation. It seemed doubtful if the operation itself was the direct cause of the trouble; in one case the operator ascribed it to the rapid loss of blood.

Finally, the *various external operations* and their indications. The latter depend upon the complications that are present. When there is definite evidence that the case is complicated by frontal sinus suppuration with such symptoms as render an operation on the frontal sinus advisable, then the ethmoid may be treated at the same time and through the same incision. The skin wound is extended a little lower down and the bone freely cut away to expose the infundibular region when the anterior ethmoidal cells come into view and may be freely cut away or curetted. The ring knife again seems to me the safest and most effective instrument to use, and it may be inserted through the wound and guided by the finger in the nose, or *vice versa*. It is hardly correct to state that it is possible even by this method to see what is being done. The bleeding and the small external opening render the view obtained of little use.

Watson-Williams's operation on the frontal sinus gives an excellent approach to the anterior ethmoidal region. Although I have little experience of this method in cases of suppuration I have often performed it in malignant disease, and can testify to the excellent way in which the ethmoidal region is exposed. By this operation, more than by any other with which I am acquainted, can the ethmoidal region be brought into view and a thorough dissection made right through from front to back; even the sphenoidal sinus could be opened if necessary.

An external operation should also be performed when any orbital complications are present. When there is fistula, abscess, or any swelling in the orbit, possibly or probably of ethmoidal origin, it is safer to operate through the orbit than to attempt an operation through the nose. The incision is made around the inner angle of the orbit, similar to the incision for the frontal sinus, but a little lower, and carried down to the bone. The periosteum over the inner wall of the orbit is separated from the lachrymal plate, and the sinus or abscess is thus exposed and traced to its origin. The ethmoidal cells are thus freely opened up as far back as necessary. The operation must be completed by making a free communication between the orbit and the nose, so that the subsequent drainage can be carried out from the nose. Orbital drainage alone must never be relied on.

The results of these external operations are exceedingly good. So far I have had no deaths nor any serious complication, but they are more serious than ethmoidal curettement. They involve more disturbance to the contents of the orbit, more shock, and a more prolonged convalescence. I certainly would not recommend them as the routine method of operation in chronic ethmoidal suppuration, but would reserve them for cases in which orbital or other complications are present.

With reference to *non-operative methods*, a very few words will suffice. Vaccine therapy is the only treatment which has been recently brought

forward as an alternative to operation. I regard the treatment as useless. My experience has been limited to cases in which an operation has failed to give a wholly successful result. When, after the cavities have been opened up—and in this connection I may speak of antrum and sphenoidal as well as ethmoidal suppuration—a purulent or muco-purulent discharge has persisted, I have referred the patients to various pathologists in order that cultures may be made of the organisms present and vaccines prepared. As in all these cases reasonably free drainage had been established, they might be looked on as very favourable for vaccine treatment, yet I cannot honestly say that in any single case have I seen definite improvement, although the treatment has been continued for months, even years.

Lastly, it has also been recommended that the patient be prepared for operation by a course of vaccine treatment, but if the vaccine cannot cure a case in which there is but a little remaining discharge, it is not likely to do much good where no drainage has been established. I doubt if it would diminish the risk of operation, but upon this point other views may be held.

Personally, I should prefer to rely on carrying out these operations under the most favourable hygienic circumstances, and with full antiseptic precautions; and after the operation, wherever possible, the patient should be sent into fresh, pure air to recuperate. There is no doubt that all cases of nasal polypus and suppuration heal much more rapidly if they can be sent into fresh, especially seaside air, than they do in the dirty wet atmosphere of a town.

Dr. WILLIAM BALLENGER (Chicago) said he would not defend his technique other than to say that in his hands it had proved eminently satisfactory. The speaker recognised that there were cases requiring only partial operation, but he would deal with the more complete methods. He was led to his method by noting that there were three attachments of the ethmoid—sphenoidal, cranial, and orbital—and that after making cranial and orbital incisions, the ethmoid could be removed *en masse*. Good drainage gave the best results, and avoided bad sequelæ, and he had noticed that when he operated upon the old lines of partial removal there was considerable swelling and obstruction to drainage afterwards, but since he had adopted the more radical method this had never occurred. He had had only one death since he adopted his radical method, and that was due to meningitis, which had evidently been present before operation, and then became acute. Emphysema of the orbit had twice occurred, and disappeared in twenty-four hours. He had never had orbital abscess or cellulitis, or any other complication of any moment. It was important not to pack. Anterior or posterior ethmoidal arteries did not give any trouble, but a branch of the middle meningeal might do so. He operated under local anæsthesia, allowed the patients to wait a little for possible hæmorrhage, and then sent them home, and he had done over 200 cases without being called to check hæmorrhage. The after-treatment was done at his office. It consisted of a pledget soaked in a 10 per cent. aqueous solution of ichthyol and placed for twenty minutes in the region operated upon. It was then removed, and the patient went home. He was doubtful as to the value of vaccine treatment.

Dr. MOSHER (New York) said: The anterior boundary of the ethmoidal labyrinth is made by the internal angular process of the frontal bone and the posterior surface of the ascending process of the superior maxilla. The labyrinth cannot be entered effectively unless the curette is carried outward behind the ascending process of the superior maxilla toward the lacrymal bone. Removing the anterior end of the middle

turbinate and curetting upward and not outward does not open the labyrinth to any extent. The internal angular process of the frontal bone makes two thirds, or the whole of the bony ring, which is the first part of the naso-frontal duct. The best guide to the duct is the posterior surface of ascending process of the superior maxilla. In a large number of cases the naso-frontal duct is not a tubular canal, but consists rather of a bony ring at the beginning and then becomes a triangular antro-posterior slit. This is more like an ethmoidal cell or an irregular meatus than a duct. The naso-frontal duct tends to run from without inward and to come into relationship with the anterior end of the extreme upper parts of the middle turbinate. When the drainage canal has the cell form, the anterior end of the middle turbinate makes its inner boundary. The duct, therefore, is reached most easily through the nose and through the anterior end of middle turbinate in line with the superior turbinate. A curette introduced at this point and carried outward toward the lacrymal bone and then withdrawn a little and carried straight downward and backward enters the anterior part of the labyrinth behind the ascending process of the superior maxilla and breaks down the cells through which the naso-frontal duct runs, destroying both the cells and the duct. Very little curetting is required to convert the anterior part of the labyrinth into a single cavity. In the roof of the chamber secured by these manipulations, and usually in the anterior outer angle, the opening of the naso-frontal duct is placed. The posterior half of the labyrinth is entered by piercing the attachment of the middle turbinate and by curetting still further backward, using all the while the outer side of the middle turbinate as a guide. If the head of the patient is held level, the middle turbinate guides the curette into the posterior ethmoidal cell. Often the posterior half of the labyrinth is a large cavity made up of only one or two cells. When the curette brings up against the back wall of the labyrinth, the remaining part of the middle turbinate and the lower half of the superior turbinate are removed. Then the posterior part of the superior turbinate is taken away flush with the front face of the sphenoidal sinus. The operator now recognises the inner part of the front face of the sphenoidal sinus, which is free in the nasal cavity, and the outer part, which has a common wall with the posterior ethmoidal cell. The posterior upper outer angle of the posterior ethmoidal cell is dangerous to curette or to probe. In this locality it is of the utmost importance that the operator should be sure of his landmarks. He orientates himself by finding the superior rim of the choana and by differentiating the free face of the sphenoidal sinus by proceeding upward from the rim of the choana close to the septum. Having made out the extent of the free face of the sinus, the width of the common wall between the sphenoidal sinus and the posterior ethmoidal cell is determined. The dividing line between the two parts into which the anterior face of the sphenoidal sinus is directed is made by the obliquely vertical attachment of the superior turbinate. The commonest mistake made by the operator is to get lost in the posterior ethmoidal cell. This comes about by curetting too high and too far outward, and by considering the posterior wall of the posterior ethmoidal cell as the whole of the front face of the sphenoidal sinus instead of the outer half of it. This mistake, if persisted in, will carry his instrument into the brain. Insufficient removal of the posterior part of the superior turbinate, and allowing the head of the patient to become tipped upward, are the chief causes of this confusion. After the landmarks of the front face of the sphenoidal sinus have been cleared and recognised the sinus is entered near the septum, if possible

through the ostium, and the whole of the anterior wall is removed. The mishaps of the operation are entering the orbit through the lacrymal bone and entering the posterior part of the anterior fossa of the cranial cavity at the apex of the orbit. The first accident is trivial, the second is fatal.

DR. WATSON-WILLIAMS (Bristol) was convinced that ethmoiditis and resulting polypus formation was an infective process. The process was not primary affection of the bone, but of the mucosa, and the polypi were probably the result of a localised obstruction of lymphatic vessels, leading to an ever-increasing localised oedematous infiltration. Once an ethmoiditis became established as a chronic pathological process, operative procedures to ensure free drainage were essential to a cure. Personally he preferred cutting forceps to the curette, moderately large for the lower ethmoidal cells, but small and very light for opening up the higher cells, whether posterior or anterior, and particularly for the infundibular. He went very cautiously here. Moreover, he avoided too free a removal of the vertical plate of the middle turbinated body. Only under exceptional circumstances were external operations necessary, except when the ethmoidal disease was complicated by frontal sinus involvement, and it was often possible to free the fronto-nasal duct sufficiently to allow of lavage and drainage. As regards the use of vaccines, his experience had not encouraged the belief that they would avoid the necessity for operation, however desirable they might be after operation. But in sinusitis due to, or associated with, streptococcic infection, he thought the previous injection of full doses of anti-streptococcic serum tended to prevent septic infective processes due to the operation itself.

MR. HERBERT TILLEY (London) thought that all would agree that the principle underlying the treatment of chronic ethmoid inflammation was removal of the main disease and the establishment of free and permanent drainage. Opinions only differed as to the best method of carrying out the latter. Prof. Hajek preferred, as a general rule, to proceed slowly, with great thoroughness and minute attention to detail, and since the majority of his patients were nurtured in discipline, he attained his goal, and no one would dispute how excellent were the results. In England, however, both the patient and the surgeon preferred to get rid of the trouble as quickly as possible, and few of the ordinary English patients would tolerate numerous sittings for the gradual removal of ethmoidal disease and the time involved in the treatment. Hence the speaker preferred Dr. Lack's method—namely, a preliminary application of cocaine and adrenalin to the affected region, followed by a general anæsthetic. The diseased ethmoidal cells could be quickly removed; hæmorrhage could be checked by strips of gauze moistened in hydrogen peroxide solution or adrenalin. He preferred ethmoidal forceps to the curette, but that did not affect the principle of the operation. Much information could be gained as to the progress one was making during the operation by insertion of the little finger, and one assumed that the surgeon would be wearing rubber gloves. Soft or diseased structures felt very different from the hard, resistant, normal ethmoidal cells. When very free access was desired the speaker would prefer to enter the nasal cavity under the upper lip, and remove the ascending process of the superior maxilla (Denker's method) rather than to make an external opening. The first method gave admirable access to the ethmoidal mass and left no visible scar. When chronic ethmoidal suppuration was combined with frontal sinus suppuration, he thought that

it was daily becoming more feasible to relieve and cure these cases by intra-nasal operation, that is, removal of the diseased ethmoidal cells, enlargement of the fronto-nasal canal, followed by irrigation and ultimate destruction of the degenerate portion of the lining mucous membrane of the frontal sinus by the use of strong solutions of silver nitrate.

Mr. JOBSON HORNE (London) thought the title of the discussion might lead to a misconception. For their own purposes the title was useful, inasmuch as it defined the scope of the discussion, but in the minds of others it might create the impression that chronic suppurative ethmoiditis was an entity. It was quite evident from the opening papers that the sphenoidal or the frontal sinus, or both, were not uncommonly involved. It was as well, therefore, not only on anatomical and developmental, but also on clinical grounds, to regard the frontal and sphenoidal sinuses as more highly developed parts of the ethmoidal labyrinth. He urged the use of X rays in the investigation of the extent of the disease and of the presence or absence as well as of the size and situation of the larger cells. With such anatomical vagaries it was impossible to define any routine treatment; one had to treat the individual case. He had not been convinced by the arguments put forward in favour of extreme measures being immediately adopted. Personally he was opposed to operations in the nasal regions which were not carried out under ocular inspection.

Mr. WESTMACOTT (Manchester) always used the method of operation by the intra-nasal route described by Dr. Hajek, and never in any chronic disease had it been necessary to do the external operation. He used general anaesthesia, and removed the whole middle turbinal, and then broke down the septa of the labyrinth with the hook and punch forceps. The nose was packed with gauze steeped in liquor hamamelidis (B.P.) for one to four or five hours, and then removed without renewal. Daily lavage and applications of protargol-argyrol, or iodine tincture, and occasionally pure carbolic acid. He would like to know how Dr. Hajek dealt with obstruction by the septum; further, could he explain the occurrence of a neuralgia in the nasal process of the superior maxilla which was occasionally met with? It was very persistent. He agreed with Mr. Tilley that the usual British patient would not have patience for slow methods. He had also found the sense of smell return after operation and not in others. Why was this? Was it ascending degeneration of the nerve or mechanical pressure causing death of the nerve? In other cases, even with complete filling of the nasal cavity with hypertrophies, there was no anosmia.

Dr. BRONNER (Bradford) was in favour of using large flat forceps, removing as many of the diseased cells as possible under direct examination, and to try and get permanent free drainage. Lack's operation was useful in some cases, especially when the patient could not afford the time to be examined and treated frequently. It was not fair to describe it as the operation of the future.

Dr. WILLIAM HILL remarked that there were probably few present who had performed a considerable number of ethmoidal operations of magnitude who could claim a clean record as regards mortality. Dr. Lack had not shirked this question of slight and perhaps unavoidable risk. He was, however, not quite able to follow Dr. Lack's line of reasoning when he advised that patients over fifty with ethmoidal disease should be left severely alone as far as any extensive exenteration was concerned, holding that surgical measures in such cases were literally "surgical interference," and more dangerous than the neglected disease.

Seeing that fatal complications were usually due to stirring up an infected area with resulting septic meningitis, and not to shock and excessive bleeding, which two latter might be urged as a contra-indication to operation in those past middle age, he doubted if the slight mortality from intra-cranial septic infection would be found any greater in the old than in the young. As far as he could gather, the danger of subsequent fatal septic meningitis bore no relation to the magnitude of the operation or to the microbic findings. One of his hospital patients had died from diffuse meningitis after so slight an operation as removal of the anterior extremity of the middle turbinal. It was true that there were two other unexpected deaths from sepsis in the same ward during the same week. His (the speaker's) remarks concerning the apparent want of proportion between the magnitude of the operation and the risk of fatal intra-cranial sepsis were not intended to apply to operative mishaps where the cranial cavity was accidentally opened up. He had heard much of the danger of injuring the cribriform plate; as a matter of fact, that structure was protected by its high position above the extremely narrow highest meatus and was extremely difficult to get at if fairly large-sized forceps and curettes were used, and this was an argument against the small cutting forceps advocated by Dr. Watson-Williams. Although he (the speaker) usually relied on the method of operating favoured by Dr. Laek, yet he admitted that since he had watched Dr. Watson-Williams perform his osteoplastic operation he realised that that procedure was the ideal one to employ in sinusitis in which there was not only extensive ethmoidal disease, but also involvement of the frontal and sphenoidal sinuses. By no other method that he knew of could such an extensive exenteration of the diseased sinuses be accomplished. It appeared to him much easier by Watson-Williams's operation to avoid getting out of bounds—for example, entering the orbit or cranial cavity. As to Dr. Ballenger's method, the drawback to an operation performed from behind forwards was that it was a blind method, and its successful performance depended on the sense of touch and accurate direction: moreover, in using a single instrument, cutting not only vertically but also transversely, it had to be borne in mind that, whilst the posterior cells were wide transversely, the anterior ones were often extremely narrow, and there was risk of opening the orbital cavity. It was true this was not often followed by serious results if the periosteum were intact. Dr. Mosher's modification of the intra-nasal method of first perforating the infundibulum and upper anterior ethmoidal cells high up above the region of the *agger nasi* instead of the usual method of first entering the bulla (Killian) seemed to possess the theoretical advantages he claimed for it on anatomical grounds, and he (Dr. Hill) was glad to hear that Dr. Mosher had found no great difficulties in successfully putting it into practice. Their object, no doubt, should be to open up as many as possible infected cells which were accessible, but when Dr. Ballenger and others used the expression, "complete ethmoidal exenteration," they were certainly claiming too much for operations performed through the nose; for the upper ethmoid cells in some instances formed a quite inaccessible labyrinth in the base of the skull, exceptionally permeating the wings of the sphenoid. He had seen a specimen where the most outlying cell was quite 2 in. distant from the nasal cavity. This was the reason why even a very extensive exenteration often resulted in relief rather than cure, and it was rather surprising that their necessarily incomplete operations afforded so much relief as they usually did.

Prof. НАЖЕК, in reply, stated that, of course, opinions varied, but

he adhered firmly to the principle of seeing everything. He advocated no definite method of operation, for most ethmoids differed; but he believed in removing middle turbinate, and then diagnosed as to extent of trouble, and then the extent of his operative procedure depended upon the extent of the disease. Dr. Ballenger did not desire to defend his technique, but his experience had taught him that the better the drainage the less the danger of secondary trouble.

PROCEEDINGS OF THE SCOTTISH OTOLOGICAL AND LARYNGOLOGICAL SOCIETY.

Meeting in the Royal Infirmary, Edinburgh, November 30, 1912.

DR. J. S. FRASER *in the Chair.*

Reported by DR. W. S. SYME.

The Pathological Changes in Various Stages and Types of Labyrinthine Suppuration.—J. S. Fraser, M.B.—Dr. Fraser gave a lantern demonstration, showing serous labyrinthitis, fibrino-purulent labyrinthitis, purulent labyrinthitis (manifest), purulent labyrinthitis (latent), healed labyrinthitis (with compensation).

Malignant Stricture of the Œsophagus; Removal of the Disease by External Operation; Patient shown.—J. S. Fraser, M.B.—Female, aged forty-nine, had complained of difficulty in swallowing for four years. This had gradually increased. Fluids could be swallowed readily. She had no pain. There was no bleeding. She was getting thinner. Laryngoscopy showed slight swelling of the arytaenoid region.

Œsophagoscopy revealed a cauliflower-like growth of pinkish appearance in the hypo-pharynx immediately above the mouth of the Œsophagus. A piece of the tissue was removed and a report of papilloma was given. The clinical appearances, however, made a diagnosis of malignancy highly probable. Mr. J. W. Struthers, on October 21, performed Œsophagectomy at Leith Hospital, removing about an inch and a half of cervical Œsophagus. This area contained a large circular ulcer which had strictured the tube; no glands could be seen or felt. The lower cut end of the Œsophagus was stitched to the skin incision, and the patient was fed in this way.

Malignant Stricture of the Œsophagus: Removal of the Disease by External Operation.—A. Logan Turner, M.D.—Female, aged thirty-seven, was referred for examination by Mr. Wallace in November, 1910. She complained of difficulty in swallowing, first noticed eleven months before. She dated her symptoms as arising after a fish-bone had stuck in her throat for three days. Difficulty in swallowing solid food was first noticed, and it became necessary to have the food finely minced. Swallowing was accompanied by pain located to a spot behind the larynx. Examination of the upper air-passages revealed nothing abnormal. Œsophagoscopy, under local anaesthesia,

demonstrated, behind the cricoid cartilage, a fleshy looking vascular infiltration on the posterior wall of the gullet, the most prominent edge of which was covered with a white slough. No attempt was made to pass the tube through the stricture, but a piece of tissue was removed. Microscopic examination showed it to be a squamous epithelioma. Mr. Wallace removed the diseased area through an incision on the left side of the neck, and introduced a tube through which the patient has since been fed. The patient is well two years after the operation.

Dr. PORTER asked if one was justified after oesophagoscopy in advising operation if the instrument could not be passed through the stricture. He had seen a case operated on under these circumstances and the tumour removed, and then on attempting to pass a bougie into the stomach a second portion of disease was found below the first behind the sternum, and quite beyond the reach of the surgeon.

Dr. LOGAN TURNER remarked that a bismuth meal and X-ray photograph might have overcome the difficulty in Dr. Porter's case.

Dr. FRASER said in his case the direct examination was very misleading. A cauliflower-like growth was seen in the hypo-pharynx; two small pieces removed, and microscopical examination showed it to be papilloma. If they had relied on the microscopic examination alone and not on the clinical signs it was probable that oesophagectomy would not have been done. The specimen, removed by operation, showed that the case was one of epithelioma.

Nasal Accessory Sinus Disease: Report on 76 Consecutive Operations on the Nasal Accessory Sinuses (11 fronto-ethmoidal, 52 antral and antro-ethmoidal, 3 ethmoidal, 6 sphenoidal and spheno-ethmoidal, 4 dentigerous cysts).—J. S. Fraser, M.B., and Raymond Yerel, M.B.¹

Dr. SYME dealt with ethmoidal disease by means of the ring curette in the way advocated by Lack. He thought this method more radical and the results more satisfactory than those obtained by Luc's or other forceps.

Dr. ADAM considered the rash to which Dr. Fraser referred as septic. In one case of double antral suppuration the rash occurred twice; the septic absorption seemed to be promoted by the application of adrenalin.

Dr. LOGAN TURNER was interested in Dr. Syme's experience of Lack's method; it was an operation which he did not care to do. He would prefer to operate upon the ethmoid by an external operation, especially if there was suppuration.

Dr. BROWN KELLY said that a surgical rash was a recognised complication as well as a variety of scarlet fever following operations. Almost thirty years ago his father wrote a paper on traumatic scarlet fever, and reported several cases in children in which scarlet fever had developed within fifty hours of receiving a head injury. There had been no exposure of the patients to infection and subsequently none of the other members of their families developed the disease. Ten years ago, also, Wyatt Wingrave wrote a paper on tonsillotomy rash; he had twenty-six cases in seven years. Three of these proved to be scarlet fever and one diphtheria. The remainder were simple non-specific cases. In reply to Dr. Fraser's query Dr. Kelly remarked that his experience was that these cases do desquamate.

Dr. MACKENZIE BOOTH said that some cases he had seen did not desquamate.

¹ See JOURN. OF LARYNGOL., RHINOL., AND OTOL., February, 1913, p. 69.

Dr. FRASER asked, as a practical point, Was it necessary to send these patients to the Fever Hospital?

Dr. MILLIGAN had seen four cases of tonsillotomy rash, and had taken the responsibility of not sending the patients away from home. In no case did scarlet fever develop, but in each there was a very fine desquamation, much finer than in scarlet fever; no one else got scarlet fever from them. He considered the rash was a manifestation of sepsis.

Dr. KELLY remarked that Dr. Fraser apparently had no cures after exploratory washing of the antrum. Every year he had several cases which were cured merely by washing out two or three times through Lichtwitz's cannula. Dr. Fraser had performed the alveolar operation in two cases, *i. e.* in 4 per cent. The question of the relative frequency of the nasal and dental origin of antral suppuration no one could decide, but 4 per cent. as of dental origin seemed to him undoubtedly low. He would like to know the opinion of the members as to which method was best. He had, of course, frequently used the intra-nasal operation, but had not found it better than the alveolar one; when the latter did not succeed he went on to the Caldwell-Luc operation.

Dental Surgery in its relation to Rhinology; illustrated by Lantern-slides.—J. H. Gibbs, L.D.S., F.R.C.S.E. —(This paper appears at p. 138 of the present issue of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.)

Lantern Demonstration, exhibiting the production of both Congenital and Post-natal Deafness by Congenital Syphilis; Family Trees shown.—J. Kerr Love, M.D., and Carl H. Browning, M.D.—Dr. LOVE said: In many of the families the Wassermann test has been carried out in every living child, and, wherever possible, the mother has been included. In one or two cases the blood of the father has also been tested. In some families, because the members are scattered, a complete Wassermann test has been impossible, and in some the same result has been due to refusal to have the test applied. But in no case is the diagnosis of syphilis in any doubt. This is surely a remarkable group of families. In twenty-one families there are 172 pregnancies; there are 30 miscarriages or stillborn children: including these there are 75 deaths, nearly all in the first or second year; and, in addition to these, there are 31 deaf or deaf and blind children. There remain 66 living children, of whom many are known to have been born before the poison entered the parental blood. As a rule I have called the 66 living children healthy, but by this term I mean only that they are not blind or deaf. Many of them are not healthy, and more will become unhealthy, because the poison has been shown to be in their blood. Nearly two thirds of the children are dead, or, if they are alive, are deaf or blind, or both, and, with a few exceptions, there are no adults in the families. In many of the families one or more deaths from meningitis have occurred. It is doubtful if any disease, even tuberculosis, is so destructive of child life or so disastrous to child health as syphilis. Tuberculosis may appear in a larger number of families, although even this may be doubtful. By far the commonest cause of death amongst these young children is meningitis, or some form of head affection, going under the name of fits, convulsions, etc. Is there not here a partial explanation of the great number of deaths from meningitis? And yet this disease (syphilis), so destructive to child life and so disastrous to child health, is not notifiable, and amongst the poor is hardly ever treated.

The conclusions which may fairly be drawn from a study of these trees are, I think, as follows:

(1) Syphilis is the cause of a very high death-rate amongst the young children of parents affected with the disease.

(2) Syphilis is a common cause of deafness and blindness amongst these children, these symptoms coming on most commonly during the school period.

(3) Syphilis is a cause of congenital deafness amongst these children—a fact which has often been suspected, but, as far as I know, has not hitherto been proved.

(4) There is a meningitis of congenital syphilis causing a high death-rate and a deafness rate which cannot at present be estimated. The application of the Wassermann test during the course of the meningitis of young children would almost certainly discover the syphilis cases. Whether syphilitic meningitis is clinically separable from tuberculous meningitis and sporadic cerebro-spinal fever or not, it is almost certain that it often goes by these names.

Dr. BROWNING said, in a certain number of cases of sporadic congenital deafness a strong positive Wassermann reaction has been obtained, or a weak positive result in the patient has been associated with a marked positive reaction either in a parent or in a brother or sister: these results furnish an undoubted proof of the presence of syphilis in the affected families. The fact that in one instance the existence of syphilitic infection has been detected by a positive Wassermann reaction in only one child out of a family of seven, four of the five children of which are congenitally deaf, but present no signs of disease, shows that we are dealing in these cases with syphilis in a relatively inert form—an expiring syphilis apparently. When considering the aetiology of sporadic congenital deafness in the light of the Wassermann reaction it is necessary to bear in mind exactly what information this test affords. A positive reaction is the rule when there are signs of active disease due to a wide dissemination of the causative agents throughout the body; on the other hand, when the disease has become latent or where the activity of the parasites is limited to a small area the reaction is negative in fully 50 per cent. of cases. Thus a negative reaction cannot be taken as a complete proof that syphilis is absent, it may equally well occur when a once active infection has become dormant. Now, in cases of sporadic congenital deafness the damage has been done before birth, and the fact that further signs of disease have not manifested themselves at any time in other organs shows that there has been no marked wide-spread activity of the causal agent. Since, then, the active disease process has come to an end before birth, and the patients, otherwise apparently healthy, have not been examined till many years later, it is not surprising that the proportion of positive reactions is comparatively small. In a number of sporadic congenitally deaf patients doubtful reactions have also been obtained. Such reactions taken by themselves would probably have no positive import, but supposing they had occurred in patients who had been treated with the specific remedies for a known syphilitic infection they would have been taken as a sign that the infection was still present, although in an attenuated form. Similarly the not infrequent occurrence in deaf cases of these suspicious reactions, which in tables cannot justifiably be classed except as negative, when taken along with the definite positive results mentioned above is highly suggestive. Thus the results, as a whole, indicate that syphilis is the causal factor in a considerable number of cases of sporadic congenital deafness, and justify the conclu-

sion that the part which syphilis plays in the production of this condition may be much greater than can be detected by such a method as the Wassermann test, carried out at a date long after the disease has ceased to be active.

Dr. MACKENZIE BOOTH asked whether salvarsan had been tried in syphilitic deafness of the chronic catarrhal variety.

Dr. KERR LOVE replied that in the cases of congenital syphilis under discussion, salvarsan seldom or never produced the slightest improvement in the deafness. A large proportion of the cases had been treated in the Royal Infirmary, Glasgow, and this had been the result as regards the deafness, although syphilitic manifestations, such as an ulcer of the throat, might be improved.

Large Keloid Involving Scar after the Mastoid Operation.—

A. Logan Turner, M.D.—Boy, aged ten. In September, 1908, the complete mastoid operation was performed on the right ear. Primary union of superficial wound. In January, 1911, he returned to hospital with a large keloid in the situation of the old incision. This was cut out; primary union. In July, 1912, a larger keloid than before is present.

Dr. MILLIGAN drew attention to the fact that Dr. Logan Turner had given no theory as to the production of these keloids. They were very curious and interesting cases. He did not know whether Dr. Logan Turner had read a paper by Dr. Senn, of, he thought, Chicago, who advanced the theory that these keloids were due to locked-up micro-organisms. There might be something in the theory. He (Dr. Milligan) had a case a year ago in which a large keloid formed—not such a good specimen as that shown—quite as big as the end of the thumb, and more over the mastoid process. It was excised quite widely, but the patient turned up at the hospital a short time ago because of a return of the keloid. He did not think that that could have been a case in which the micro-organisms had been locked up a second time, because care was taken to go absolutely down to the bone. The other theory was that it was due to the mobility of the platysma muscle. Had Dr. Turner any theory as to the production of these keloids, and any proposal in order to prevent their recurrence?

Dr. LOGAN TURNER could not throw any light on the origin of keloids. The interest of his case lay in the fact that it was a second recurrence. He certainly would not remove it again. The oftener the keloid was removed, the more likely it was to return. That point was rather against Senn's theory.

Dr. MACKENZIE BOOTH said that some years ago, when the X-rays were first introduced, he had seen one case improved by their use.

Sarcoma of the Left Tonsil in a Young Man.—**A. Logan Turner, M.D.**—Male, aged nineteen. First felt some discomfort on the left side of his throat two months before he was examined. Since then he noticed a gradually increasing thickness in his speech. He suffered no pain, and he gave no history of previous sore throats. Examination early in July, 1912, showed the left tonsillar fossa occupied by a large swelling projecting upwards into the soft palate in the position of the upper pole of the tonsil, while below and internally it crossed the mesial plane; pink in appearance, it was covered by smooth mucous membrane without any area of ulceration. It was firm to the touch, evidently encapsulated, permitting of a limited degree of mobility. The posterior pillar was concealed from view, but the anterior pillar, clearly defined,

was pushed forwards. There were no enlarged glands. The diagnosis of a simple tumour was made. Under local anaesthesia, and with scissors and snare, it shelled out readily with the exception of a limited area of adhesions. (Sections shown.) The pathologist reported the tissue to be sarcomatous. No recurrence at this date.

Dr. PORTER said the peculiarity was that there was no infiltration.

Dr. GARDINER said a sarcoma could usually be shelled out much more easily. Here there was no infiltration of the surrounding tissue.

Dr. LOGAN TURNER remarked that the encapsulated appearance was very striking; he never suspected sarcoma; the tumour certainly did not suggest it. Should the condition recur, it might be wiser to do an external operation.

Four Cases of Lupus of the Nasal Mucous Membrane treated with Nascent Iodine (Pfannenstiel's Method).—A. Logan Turner, M.D.—Sodium iodide was administered in small doses at first, and at the end of one week the patients were taking 30 gr. in twenty-four hours. At this stage the nasal cavities were carefully cleansed and then packed with strips of sterilised gauze. The patients were then provided with medicine droppers and a solution of hydrogen peroxide containing a small quantity of hydrochloric acid and perchloride of iron. They were instructed to keep the plugs constantly moist by dropping in the solution. The plugs were changed at intervals. Although the treatment was irksome, it was willingly persevered with, the patients being encouraged to do so. Treatment by other methods had not proved very satisfactory.

Dr. FRASER wanted to know how this method of Pfannenstiel's acted. Did it liberate nascent iodine or ozone? He had used the treatment in tuberculous disease of the ear after the radical mastoid operation and found it do exceedingly well.

Dr. J. D. LITHGOW said he believed Pfannenstiel's explanation as to the action in question was that the loose molecule of oxygen in the peroxide of hydrogen applied locally was separated when this solution came into contact with the sodium iodide circulating in the tissues, with the result that this salt was broken up and the nascent iodine attacked the tubercle bacillus.

Dr. LOGAN TURNER said Pfannenstiel used ozone, but by the improved method — Strandberg's method — hydrogen peroxide was found more useful. The patient had been seen lately; the man showed some recurrence; he had had no treatment since July. The method was not of value in treating lupus of the skin. The comparatively rapid way in which the lesion clears up was most striking.

Treatment of the Bone Cavity after the Radical Mastoid Operation with Scarlet-Red.—T. W. E. Ross, M.D.¹—A series of fifteen cases had been experimented on. An 8 per cent. ointment of scarlet-red in vaseline was used. After being melted to the liquid state narrow sterile strips of ribbon gauze were dipped in it, and these were used to pack the wound. This dressing was commenced in five cases after the removal of the first dressing of iodoform worsted, five days after the operation; that is to say, the scarlet red was used before granulations had formed. In ten cases the scarlet-red was not applied until after the bone surface was covered with granulations, bismuth gauze being used for two or three dressings in the first instance. The second method was

¹ This paper will appear *in extenso* in a later issue of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOL.

regarded as the more satisfactory. In the majority of the cases the scarlet-red was removed after twenty-four hours, sterile gauze and eucalyptus vaseline being substituted for a period of twenty-four hours. In the remainder the scarlet-red was left for forty-eight hours, and then a packing of bismuth gauze substituted for twenty-four hours. This treatment was continued until epithelialisation was complete. The average time for epithelialisation, irrespective of the exact method followed, was thirty-six days from the date of the operation. In the majority of the cases the hearing was improved. The method requires very careful supervision.

Dr. THOMAS BARR was sure everybody was desirous of more light on the after-treatment of the radical mastoid operation. On examining the five cases shown he felt that they were somewhat disappointing. In three at least there was distinct evidence of discharge; the patients were syringing daily, and he supposed it was five or six months since the operation. He was afraid, therefore, that one had not been very much helped by these cases or encouraged to try the scarlet red. These cases brought back to his mind the proposal which was made at the meeting a year ago, that it would be well to take up such a subject as "the present position of the radical mastoid operation, its technique, its after-treatment, and its results," now that they had had experience of the present operative methods for a good many years. This would, he thought, be an excellent subject for a meeting entirely devoted to it. One would like to see the results in a series of consecutive operations, not in selected ones.

Dr. J. D. LITHGOW said the large size of the cavity in Dr. Ross's cases, although due in part to the rapid epithelialisation favoured by the scarlet-red preparation was principally due to the packing of the ear. In his experience the preparation of scarlet-red in vaseline was undoubtedly more efficient, as the vaseline alone caused a distinct increase in the rate of epithelialisation, though of course not so marked as when the scarlet-red was added to it. They would find abstracts of the literature on this subject in *Merck's Annual*.

Dr. MILLIGAN thought the question was—Did scarlet-red stimulate epithelialisation or did it not? Take, for instance, an ulcer on the leg; dress that ulcer with scarlet-red and another ulcer with something else, nobody who had watched the effect of scarlet-red could doubt that it did promote epithelialisation, but how it did so he had not the slightest idea. Coming to the ear, the question was, Did it allow the epithelialisation to be more quickly affected than by other methods of treatment? He thought the first thing to be considered was, was the Eustachian tube closed absolutely? In one of the cases he had seen to-day the Eustachian tube was not thoroughly closed. There were other preparations that had precisely the same effect as scarlet-red. He first used scarlet-red some five years ago; he still used it, and always used a 1 per cent. solution in olive oil. He waited until the wound was covered with granulations and then applied scarlet-red. Certainly the result could not be due to packing, because he had eliminated that: the omission of packing materially expedited healing. In a case a few weeks ago, where the whole ear was taken off for extensive malignant disease, where the wound was as big as the palm of the hand, there was a healthy granular surface, and in a fortnight it was absolutely epithelialised. He thought scarlet-red an excellent thing to use, and had formed the impression that it also kept the wound clean.

Dr. LOGAN TURNER quite agreed that the results in the cases shown were disappointing; out of six there were only two healed. He would

like very much to know how Dr. Milligan got his Eustachian tubes closed.

Dr. MILLIGAN admitted it was a difficult thing, but essential.

Dr. LOGAN TURNER agreed that it was, with or without scarlet-red.

Abstracts.

PHARYNX.

Place, E. H.—The Bacteriologic Diagnosis, Intubation, and Antitoxin Treatment of Diphtheria. "Boston Med. and Surg. Journ.," September, 1912.

When diphtheria-like organisms are found in false membranes the case is almost invariably one of true diphtheria. In aural or nasal discharges, however, the chance of error is much greater. Hoffman's bacillus, the xerosis bacillus, and *B. pyocyaneus* are all frequently confounded with *B. diphtherie*, the relationship of the various diphtheroid bacilli being still a matter of doubt. Strictly speaking, therefore, the virulence test remains the only way of proving the diphtheria bacillus.

Like most Americans the author is a strong believer in intubation, and only resorts to tracheotomy when respiration has absolutely failed. Plugging of the tube is found to be a rare accident; out of 414 cases of death referred to laryngeal obstruction in which intubation had been performed, 76 per cent. died from pneumonia, 20 per cent. from the extension of the membrane into the lung, and only 1 per cent. from plugging of the tube.

The frequency of pneumonia in cases of severe obstruction makes it evident that it is of the greatest importance that early relief should be given: stridor, marked retraction, or use of the accessory muscles are considered indications for intubation even in absence of cyanosis.

The early administration of antitoxin is strongly urged, and large, even heroic doses are recommended. "The first dose should be as large as the physician can decide is necessary, and intervals of twenty-four hours should not be allowed to elapse before the next if there is any doubt of its sufficiency."

The author finds it occasionally necessary to give as much as from 400,000 to 500,000 units. Anaphylaxis is extremely rare, but whenever there is the slightest fear that serum will prove dangerous, an infinitesimal dose should first be injected. If no ill-effects appear after a short time the regular dose may be given.

Knowles Renshaw.

LARYNX.

Horn, Henry.—Palliative Treatment of Terminal Laryngeal Tuberculosis. "Journ. Amer. Med. Assoc.," September 7, 1912.

The marked benefit resulting from injecting alcohol (3 to 5 c.c. of 85 per cent. solution) into the superior laryngeal nerve in tuberculosis of the larynx is the subject of a paper in which the results were reported in ten terminal cases, all but three of which showed extensive ulceration. The results in seven of the cases was ideal, the pain and dysphagia being completely relieved. The failure in the other three was attributed to either faulty technique, or the fact that the epiglottis was involved, in which case, owing to its different nerve supply, no improvement was to be expected.

Birkett (Rogers).

Fetterolf, G.—The Relief of Pain in Advanced Tuberculosis of the Larynx by means of Injections of Alcohol into the Internal Laryngeal Nerve. "Annals of Otol., Rhinol., and Laryngol.," vol. xxi, p. 129.

Gives the history, surgical anatomy, technique, dangers, and a table of twenty-five cases. The author concludes that this method has a distinct place in the treatment of inoperable cases. It is a procedure requiring no special apparatus or training, is not hazardous or dangerous, is not seriously painful, can be repeated, and any untoward effects which can be produced are but temporary. In the large majority of cases pain is relieved instantaneously, deglutition becomes easier, and a greater amount of rest and sleep is secured.

Macleod Yearsley.

Abrahams, A.—Septicæmia following Septic Laryngitis. "Lancet," August 24, 1912, p. 512.

Man, aged forty-five, stout, plethoric, and over eighteen stone, suddenly attacked with stridor and dyspnoea. Larynx markedly inflamed and œdematous, œdema of hands and feet; epithelial casts and 0.1 per cent. of albumen in urine. Culture yielded *B. pneumococci*. Improved in urgent symptoms after admission, and prepared to leave hospital on fifth day. On the sixth day, however, temperature rose to 102° F., and twenty-four hours later to 104.6°, with marked rigor. Rigors occurred irregularly for five days, and an abscess formed in the right subacromial bursa, which was opened and drained. The pus showed short-chain streptococci. A vaccine was administered, but death ensued thirty-four days after the first onset of dyspnoea. *Post-mortem* examination showed œdema laryngis, large vegetations on tricuspid valve, septic infarcts in both upper lobes of the lungs. The heart's blood contained streptococci.

Macleod Yearsley.

NOSE.

Richter, Ed.—A Forceps for widening the Olfactory Fissure. "Zeitschr. f. Ohrenheilk.," Bd. lxiv, No. 4.

In order to avoid, if possible, the resection of the middle turbinate in order to reach the sphenoidal sinus in cases of sphenoidal sinus suppuration, the writer has designed a pair of forceps. The two nasal ends of the forceps consist of two flat parallel plates which can be separated from one another when introduced. Some amount of force may be used, and the ethmoidal cells are felt to break and flatten out. If the ethmoidal cells are very large these are broken first with crushing forceps; in this way the ostium of the sphenoidal sinus is able to be seen or probed. In order to open the sinus the writer employs Hajek's hook, as he has found that most of the forceps or punches made are too large for the purpose.

Lindley Sewell.

Onodi, A. (Budapest).—The Relationship of the Tear-Sac and Duct to the Accessory Sinuses and Nares. "Monats. f. Ohrenheilk.," Year 46, No. 4.

A most elaborate and embrative article in two parts—the first dealing with the subject from its anatomical, and the second from its clinical aspect—illustrated with 43 excellent plates.

The first part, as its description implies, consists in a detailed review of the lachrymal fossa and tear-duct largely by means of figures taken from actual sections at varying levels and in different positions. Although

nothing before unknown is here discovered, the sections are well worth study to those who are endeavouring to master the intricate topography of the nose and adjacent regions.

In the second part Onodi states that as far back as the first half of the eighteenth century a new artificial passage into the nose was recommended in cases of obstruction of the duct, and that the causal relation between pathological conditions of this structure and the nose has long been well known, about 90 per cent. of these troubles being referable to its nasal environment. The various ways in which the duct can be involved are discussed, which practically results in a reference to all intra-nasal disease.

As regards treatment, of course the nasal lesion, if giving rise to offence and able to be remedied, should be the first objective, and failing this means of approach, other direct methods are described and compared. This latter portion does not, however, lend itself to abstraction, and the original should be consulted by those interested in the subject.

Alex. R. Tweedie.

Loeb, Virgil.—Cubic Capacity and Superficial Area of the Maxillary Sinus. "Journ. Amer. Med. Assoc.," August 3, 1912.

To determine the cubic capacity and superficial area of the antrum of Highmore horizontal sections of twenty-one decalcified heads were made. The casts obtained were mounted in pairs, and gave a clear idea of the size, form and irregular contour of the sinuses. By measuring the displacement of water resulting from the immersion of these casts, rendered impervious to water by melted paraffin, the cubic capacity, which averaged 12.94 c.c., was determined.

The superficial area was obtained by taking a strip of adhesive equalling 25 sq. in., from which pieces were cut and fitted on each cast until it was entirely covered. The general average was found to be 31.63 sq. in., and the two sides showed a marked uniformity.

Birkett (Rogers).

Loeb, H. W.—The Cubical Capacity and Superficial Area of the Sphenoidal Sinus. "Annals of Otol., Rhinol., and Laryngol.," vol. xxi, p. 1.

An interesting investigation illustrated by fifty figures. Plaster casts were taken after section of the head preserved in formalin. The casts prepared show the cubical capacity in the twenty sinuses examined to vary from 0.6 to 11.8 c.cm., with an average of 5.145 c.cm.; and the superficial area from 2.4 to 28.2 c.cm., with an average of 16.65 c.cm. A formula is suggested for estimating the superficial area from a known cubical capacity. This formula is: $Y = 0.2 X + 4.4$; X is the volume, and Y the superficial area divided by the volume. In order to determine the superficial area, the value of Y must be multiplied by the already known volume of the sinus.

Macleod Yearsley.

EAR.

Luders, Carl.—Hæmorrhage following Paracentesis of the Tympanic Membrane. "Zeitschr. f. Ohrenheilk.," Bd. lxxvi, No. 2.

The writer describes a case in which severe and repeated hæmorrhage followed paracentesis of the tympanic membrane, resulting in death from pyæmia. Summarising an investigation into this matter, he states that certain constitutional and infectious diseases may give rise to severe

hæmorrhage after paracentesis not uncommonly, but bleeding of such a degree as to endanger life is extremely rare. A search through the literature has only brought to light eight such cases, and in all these cases the source of the hæmorrhage was the jugular bulb, which has bulged through into the middle ear; in no case did the hæmorrhage arise from the internal carotid. The danger to life arises not so much from the injury to a big blood-vessel as to the fact that the middle ear is septic, and, therefore, pyæmia may result (twice in eight cases). In the second of the writer's cases the bleeding recurred several times, and an operation was undertaken to control it, the lateral sinus being exposed and packed above and below as far as the jugular bulb. Pyæmia, however, occurred, and the patient died. The author concludes that in such cases the jugular vein should be ligatured in the neck at the same time.

Lindley Sewell.

Haynes, Irving S., M.D.—The Surgical Treatment of Meningitis.
"Laryngoscope," June, 1912.

The lethal effects of meningitis are due to three factors—the toxins manufactured by the bacteria, the toxins generated in the tissues as the result of bacterial activity on them, and the mechanical effects of the pressure produced within the skull by the products of inflammation. Medical treatment has hitherto proved unavailing, and surgical aid has not been resorted to until the patient is moribund. Death is caused finally by the increase of intra-cranial pressure progressing to such a point as to finally shut off the blood-supply from the vital centres, and can only be averted by removal of this increased pressure. Attempts to achieve this end have been made by the operations of ventricular puncture, lumbar puncture and laminectomy. Ventricular puncture, however, cannot drain pus from the base, may not relieve pressure, and adds the danger of infection of meninges, cortex and ventricles. Lumbar puncture is valuable for the positive diagnostic findings it may give, but fails as a therapeutic measure, except in cases of serous meningitis, owing to the uncertain drainage and the risk of plugging of the foramen magnum by the brain stem. The same objection applies to laminectomy. To get over these defects, the author has devised an operation for draining the cisterna magna. This cavity, the largest subarachnoid space, is in very free communication with the other spaces without the brain and cord, and especially with the ventricular cavities, through the foramen of Magendie, which is always large and seldom if ever closed. The operation also has the advantage of causing no hernia, and so drainage is not interfered with. It should be performed directly a diagnosis is made, valuable early signs being a rising blood-pressure, œdema of the optic papilla, absence of carbohydrates from the cerebro-spinal fluid, and an irritable or clouding sensorium. The operation is performed as follows: The head having been shaved, the patient is placed prone on the table with the head flexed, projecting over the end of the table, and resting on a head-rest. The anæsthetic is administered through nasal tubes. Through an incision in the middle line, from the occipital protuberance to the spine of the axis, the tissues are divided down to the occipital bone and the posterior arch of the atlas. Periosteum and muscles are stripped from the occipital bone on each side of the middle line down to the foramen magnum. The sides being held apart by a self-retaining retractor, a $\frac{3}{8}$ -in. trephine hole is made in the middle line about 1 in. from the foramen magnum, and the dura being raised, a wedge of bone is removed down to the foramen magnum with De Vilbiss forceps, being

rather broader at the margin of the foramen than above. The dura and arachnoid are punctured, and the cerebro-spinal fluid allowed to escape slowly. These membranes are then divided for the whole length of bone gap, a drain of gutta-percha tissue inserted, and the wound sutured round it. The author has operated by this method in three cases of suppurative meningitis, all in the last stages, and they all died, but the operation was easily and rapidly performed, drainage was free to the end, and all the symptoms were ameliorated.

A fourth case of otitic streptococcal meningitis operated on by Kopetzky also died, but without stupor, slowed pulse, or choked disc, cure being prevented by the extent of the infection.

The author states that with early diagnosis and operation some lives will be saved.

A. J. Wright.

BOOKS RECEIVED.

Meningitis, Sinus Thrombosis and Abscess of the Brain. By *John Wyllie, M.D.* Pp. ix + 258, 10s 8vo. Price 6s. 6d. net. London: H. K. Lewis, 1911.

Handbuch der speziellen Chirurgie, etc. Von *L. Katz, H. Preysing, und F. Blumenfeld.* Band iv, Lief. 7. Würzburg: Kurt Kabitsch, 1913.

Transactions of the Thirty-fourth Annual Meeting of the American Laryngological Association. New York: Published for the Association, May, 1912.

NOTA SUBSCRIPTA.

Paracusis Willisii and the Motor Car.—The following advertisement appeared a few weeks ago in a well-known London newspaper (names are suppressed):

An owner writes: "You are aware that although I have been a supporter of your firm from its first inception and am still perfectly satisfied with the recent six cylinder car of your make in my possession, I have lately purchased a new four cylinder chassis of foreign manufacture at a price scarcely inferior, if at all, to that which your own so fully justifies. I write, therefore, to explain to yourselves why I have done so.

"Your cars are now recognised all the world over as unrivalled, especially perhaps in the matter of silence. Each year finds them more and more perfect in this respect. Each year finds me more and more deaf.

"I find, however, *I can hear much better in a car that makes a noise.* Amid the hum of shaft, gears, and timing wheels, the tapping of valves, the puffing of exhaust, and the banging of the cut-out, I once again experience the *old familiar charm of each varying inflection of the human voice.*

"My new car is amply accommodated in all these details.

"If you consider that in regaining one of my senses, I am bereft of the rest, you will, I know, find an ever increasing number of the public to agree with you."

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THE SEMON LECTURES, 1913.

(Delivered at University College, January 22 and 24, 1913.)

SIR FELIX SEMON—HIS WORK AND ITS INFLUENCE ON
LARYNGOLOGY.

By P. McBRIDE, M.D., F.R.C.P.E., F.R.S.E.

LECTURE II.

His Work and its Influence on Laryngology.

CONSIDERING the numerous calls upon his time made by the conduct of a very large consulting practice Semon was a voluminous writer, and of course it is not my intention to discuss each of the numerous valuable contributions with which he enriched the literature of his subject, although I propose to deal more fully with those which are outstanding and epoch-making, while I shall refer briefly to some of the others. First, however, let me make a few remarks upon Semon as an author. To those who have read his many contributions to laryngology and cognate matters it must have been obvious that he was one of those who did not write without having something very definite to put before his readers—in other words, he wrote because he had a message to deliver and not because he

wished to appear in print. Thus his writings were always of interest and valuable as contributions to the literature of the subject with which he dealt. Moreover, everything he wrote was carefully considered, and when deductions were drawn they were usually correct. We all know that medical authors are commonly not adepts at clothing their thoughts in suitable language. Semon's style, however, both in English and German, was excellent, and, as I said before, his great acquaintance with general literature enabled him to enliven his pages with similes and quotations drawn from the most varied sources. Undoubtedly he had, and has, the pen of a ready writer, and perhaps this very fluency led him into the one fault which I should venture to find with his prose. I have, I believe, read everything he ever wrote, and have always appreciated the easy flow of language alike in English and in German, finding it a great and agreeable contrast to that of most medical authors whose works it has been my fortune to study. At the same time I have sometimes wondered whether the effect would have been less agreeable if the tale had been told in fewer words. I should not have ventured upon such criticism at all were it not that this—his one fault in style, if fault it be—seems to me to have had its origin in a great desire to leave nothing unsaid which might have a bearing on the subject in hand, and thus to forestall all conceivable criticism and to prevent any possible inaccuracy. And if this has been his desire, and if you wish to see for yourselves how well he has succeeded, I would ask you to study some of Semon's controversial writings, as, for instance, his correspondence with Prof. O. Rosenbach¹ on the question of priority with regard to the greater vulnerability of the abductor fibrils of the recurrent nerve, or his article on the "Discovery of Laryngoscopy and the case of Türk-Czermak"² and his subsequent reply to Prof. Kohler³ with regard to Garcia's claims as the inventor of laryngoscopy. I might quote other instances, but those just referred to will be found to illustrate sufficiently the point I wish to make, viz. that although it may sometimes appear to the reader of Semon's works that he disenses his subjects at too great length, it will usually be found that the same accuracy could have been attained in no other way. And accuracy is the keynote which pervades all his work. Whether we consider his contributions to clinical pathology, as, for example, his paper on "A peculiar form

¹ "Forschungen und Erfahrungen," by Sir Felix Semon, vol. i, p. 209.

² *Berlin, klin. Woch.*, 1906, No. 6.

³ *Ibid.*, 1906, No. 14.

of Chronic Hyperplasia of the Mucous Membrane of the Upper Respiratory Tract,"¹ or his records of unusual cases and incidents such as "Unilateral Incomplete Graves's Disease after Removal of Nasal Polypi,"² the obvious fact at once strikes the reader that Semon is disinclined to attempt explanation or to propound hypotheses where his reason tells him that no satisfactory explanation is in the present state of our knowledge possible. His keenly critical mind, too, is shown by the fact that, voluminous writer as he was, he never suggested novel remedies without carefully guarding himself against fallacy or exaggeration. As a corroboration of this statement I would instance his paper on "The Therapeutic Value of Complete Vocal Rest during Sanatorium Treatment of Laryngeal Tuberculosis,"³ and perhaps you will permit me to quote from this very important article to corroborate my statement: "Nothing is further from my intention—and I desire at the beginning of my communication now to emphasise this fact—than to assert that complete vocal rest continued for a length of time is a certain remedy in the treatment of laryngeal tuberculosis. I have myself had experience to the contrary. Nevertheless," he continued, "it appears to me that the time has come to recommend this method for renewed trial under peculiarly suitable conditions, such as are found in sanatorium treatment." Again, after recording seven very striking cases in which a cure resulted, he writes: "But I wish to repeat it again with emphasis, this method does not constitute a panacea for all such cases." The cautious attitude exemplified by these quotations appears in all Semon's references to therapeutics. While he is quite prepared to consider any reasonable method of treatment proposed by others he has always carefully guarded against letting his enthusiasm be excited until its value has stood the test of time and experience. This being so, I need hardly add that Semon has not often had occasion to become enthusiastic excepting in the case of certain surgical procedures, to one of which I shall refer later. He preferred rather to deal with the more scientific side of laryngology, and to utilise his large experience and critical judgment in describing cases of more than usual interest, or when he had accumulated sufficient material to produce papers bearing on diagnosis and prognosis, as, for example, the work already referred to, "On Mechanical Impairments of the Functions of the Crico-

¹ *Lancet*, February 25, 1905.

² "Transactions of the Clinical Society of London," vol. xxii, 1889.

³ *Berlin. klin. Woch.*, 1906, No. 47; and *Brit. Med. Journ.*, December 8, 1906.

arytænoid Articulation (especially true and false ankylosis and luxation), with some Remarks on Perichondritis of the Laryngeal Cartilages,"¹ and "The Sensory Throat Neuroses of the Climacteric Period,"² both of them contributions of great clinical value. I would at this stage also refer to two other very important contributions from his pen bearing upon clinical pathology.

In 1895³ Semon read, before the Medico-Chirurgical Society, a very remarkable and interesting paper, entitled, "On the probable Pathological Identity of the various forms of Acute Septic Inflammation of the Throat and Neck hitherto described as Acute Oedema of the Larynx, Oedematous Laryngitis, Erysipelas of the Pharynx and Larynx, Phlegmon of the Pharynx and Larynx and Angina Ludovici." Although he was not able to adduce bacteriological proof of his contention, he brought forward a very strong case from the clinical point of view, and certainly supplied us with a most excellent, original, and practical description of septic affections of the throat, while some more recent bacteriological observations by de Santi seem now to have furnished the required proof.

In 1907⁴ he recorded a case under the title of "Tertiary Syphilis or Pneumococcal Invasion of the Soft Palate," in which deep ulceration seemed to result from pneumococcal infection, although it remained open to critics to question the non-existence of syphilis. Again, in 1908,⁵ he described another case, in which destruction of tissue and ulceration seemed to be due to the same cause, and in which probably syphilis could be excluded, while recovery resulted without the use of anti-syphilitic remedies.

Finally,⁶ just about the time of his withdrawing from practice, Semon published a third case of ulceration of the pharynx, with oedema of the larynx, in which cultures seemed at first to point to a pure pneumococcus invasion, but where the patient eventually died of tuberculosis. In all these cases Semon noted (1) the long

¹ *Medical Times and Gazette*, vol. ii, 1880; and "Forschungen und Erfahrungen," vol. i, p. 411.

² *Brit. Med. Journ.*, January 5, 1895; and "Forschungen und Erfahrungen," vol. i, p. 366.

³ "Forschungen und Erfahrungen," vol. ii, p. 377; and *Med.-Chir. Transactions*, 1895.

⁴ "Forschungen und Erfahrungen," vol. ii, p. 425; and *Monatschr. f. Ohrenh.*, 1907, No. 10.

⁵ "Forschungen und Erfahrungen," vol. ii, p. 430; and *Monatschr. f. Ohrenh.*, 1908, No. 7.

⁶ "Forschungen und Erfahrungen," vol. ii, p. 449; and *Brit. Med. Journ.*, June 26, 1909.

duration, improvement alternating with exacerbation; (2) the marked pain even when the evidence of the pathological changes in the throat was slight. While acute pneumococcal angina had been previously described, cases running the course, and showing the signs and symptoms noted by Semon, had not hitherto been observed, and I do not think the author will be offended by my suggestion that, with regard to the question of the pneumococcus producing by itself deep ulceration, we must "wait and see."

There is one observation of Semon's for which I think he has never received the full credit it deserves. In 1882 Reverdin called attention to some symptoms of myxœdema in patients from whom the thyroid gland had been removed; in April, 1883, Kocher described what he termed "cachexia strumipriva," and in 1883 Reverdin and his brother recognised the resemblance between the symptoms following thyroidectomy and myxœdema, but none of these authors suggested that the loss of the gland was the cause of the symptoms. Meantime Semon, who had studied Kocher's observations and also myxœdema, propounded the proposition that absence of the thyroid gland gave rise to cretinism and myxœdema, as well as cachexia strumipriva, and brought his views before the Clinical Society in 1883. Curiously enough, these views were at first scouted, and even ridiculed, although they turned out to be absolutely correct. Semon, therefore, is entitled to claim that he was the first to point out that loss of the thyroid gland is the cause of cretinism, myxœdema and cachexia strumipriva—no little achievement, considering all that followed from this discovery.

From the purely literary point of view—as apart from the scientific—possibly the best productions of Semon's pen were represented by the biographical notices he from time to time produced. Thus I should feel inclined to consider his "Personal Reminiscences of Virchow"¹ and his obituary notice of Sir Morel Mackenzie² as masterpieces of their kind both as to composition and contents. To read them makes one wish that the author would devote some of his well-earned leisure to the production of further word pictures and character sketches.

All through his career Semon devoted much of his energy towards placing and keeping laryngology in that position among the various specialities to which he considered it to be entitled. We have already seen that it was chiefly through his agency that it became

¹ *Brit. Med. Journ.*, September 13, 1902.

² *Internat. Centralbl. f. Laryngol.*, 1892, No. 9.

recognised in the International Congress which met in London in 1881. From that time onwards, however, there were various attempts at subsequent meetings either to keep it a subsection or to amalgamate it with other divisions, notably with otology. Such measure of success as has attended the attempts to uphold the position of laryngology in international meetings has been very largely and—I think I may say without derogating from the just claims of others—chiefly due to Semon. By his energy and personal magnetism he was able to organise laryngologists in defence of their interests, and by numerous articles from his pen he was able to justify their position so that in most cases the desired end was attained. I am not sure that we have in our ranks any other man who could have carried this particular work to the same satisfactory conclusion. He had an international reputation second to none, he was possessed of great tact, but when occasion required did not fear to give offence; he was in the best sense cosmopolitan alike as a linguist and as an author, and above all he was known to be absolutely above board and with no private axe to grind. You will observe that I do not attach all or even a large share of his success in upholding the status of laryngology to his pen but rather to his personality. Nevertheless his writings were of great assistance. In the first place the various articles he wrote in the *International Centralblatt*, whenever there was a threat to take up any position which would have resulted in lowering the status of his specialty, exerted a very powerful influence upon his co-specialists, and supplied them with a line of policy which was usually adopted. Again, if he noted anything within the ranks of laryngologists which was likely to form a stumbling-block he fearlessly laid it bare. I fancy that the majority of specialists will recognise that his paper entitled “Some Thoughts on the Principles of Local Treatment in Diseases of the Upper Air-Passages” really did good in moderating the excessive tendency to operations which at one time was a fashion, and which—at least, so many of us thought—had placed the good name of laryngology in jeopardy. Again, in a paper, “De re Publica Laryngologica,” he did not hesitate to write severely upon the tendency of German authors to consider only the work of their compatriots, and here, too, I am sure those of you who have studied Teutonic medical literature will agree that there was just ground for complaint. In order to avoid all appearance of unfairness I must add that he also mentions a similar fault of omission as common in British writers, while French and Italian laryngological literature too comes in for a share of

criticism—a criticism, however, of which we must in each case acknowledge the justice.

Semon's policy was in most cases sound, although this by no means implies that we must agree with it in every detail. He always seems to have had a fear that any undue multiplication of special societies would be attended by the risk of divorcing the specialty from its connection with general medicine—a connection upon which he rightly considered so much depended. To some extent this fear has shown itself to have been justified, and Semon wrote¹ four years ago urging his colleagues to bring matters of common interest before general rather than special audiences. One of Semon's strongest convictions was that laryngology and otology ought not to be combined in one section in congresses and meetings, although of course he made no protest against the combination in practice. Some of us, who were at one time opposed to this view, are beginning to adopt it, and certainly the tendency which has of late existed in Germany to put men whose reputation rests purely on otology in charge of combined clinics is not only mischievous but retrograde. It appears to me now that from the lines on which otology and laryngology are extending, no other deduction can be drawn than that soon they must separate. The literature of each has become so extensive, and the tendency of each to occupy new and divergent areas has of late been so marked, that they are rapidly assuming proportions which will make it difficult for the same man to teach and even to practise both. In a very interesting article entitled "The Past, Present and Future of Laryngology"² Semon takes very serious exception to a proposition made in America that the laryngo-otologist should extend his operative domain to "the adnexa and possible complications." Now here I do not agree with him. While I admit that the extensions of operating area proposed by our American *confrère* may have been too wide, and while I foresee an eventual separation of laryngology and otology, I cannot, subject to such eventual separation, for a moment believe that the principle is wrong, nor that if adopted it will damage laryngology. If you will forgive an egotistical digression, I may say that formerly I was somewhat strongly opposed to Semon's contention that for public purposes laryngology and otology ought to be considered separately. With the gradual and divergent growth of each, however, I realised that

¹ "Forschungen und Erfahrungen," vol. ii, p. 604.

² *Internat. Centralbl. f. Laryngol.*, xxv, No. 6; and "Forschungen und Erfahrungen," vol. ii, p. 610.

for this reason and on account of the immense increase of literary activity in both departments the time was approaching, if not at hand, when they must separate, at first as to sections in congresses and meetings, later as to teaching appointments and clinics, and finally in practice. This conviction was further reinforced by the recognition that whenever the aurist, the laryngologist and rhinologist began to operate from without, be it on the mastoid, trachea or accessory sinuses, his sphere of operations must become very considerably extended and would ultimately embrace all the local complications and many of the adnexa. At one time I was opposed to any such development because it seemed to me that, if the specialist once began to operate from without, relentless logic would compel him to extend his area. However, I soon found that this position was untenable, and of late, watching the progress of events from the detached position of one who has retired from active practice, it has seemed to me that such progress is towards the establishment of departmental surgery as an adjunct and direct offspring of specialism. For these and other reasons, then, I do not see eye to eye with Semon on this question.

This is, however, the only point in Semon's line of policy which I think lends itself to criticism, and even should he prove to have been mistaken in this one thing, the fact remains that partly by his writings, but chiefly by his personality, he has done more in the public service of laryngology than any other man living or dead—Garcia, Türk, and Czermak possibly excepted. Even this great work may, however, in the course of time be forgotten, but there are two subjects in connection with the history of which Semon's name must live throughout all time. I refer to his work on (1) laryngeal paralysis; (2) malignant disease of the larynx—each of which must be discussed separately and at some length.

SEMON'S WORK ON LARYNGEAL PARALYSIS.

Those of us who began to study laryngology previous to the acceptance of Semon's views as to the greater proclivity of the abductor filaments of the recurrent nerve to paralysis, both in central lesions and in those affecting the nerve-trunk, will remember how chaotic the chapters on laryngeal paralysis—even those in the best text-books—seemed to the reader. We were told, for instance, that in central and peripheral disease of the nerves paralysis affected now the abductors and now the adductors, but no logical explanation was attempted, and the whole matter seemed

to be considered as depending upon chance. Then, thanks to Semon, came light out of darkness—gradually emerging, it is true, but eventually illumining and simplifying the whole question, in a word, making the hitherto incomprehensible comprehensible alike to authors and readers, for the former could not be understood because they themselves did not understand.

It is rather remarkable to find that Semon took up this question almost immediately after he had determined to become a throat specialist. Thus in 1878 he referred before the Clinical Society of London to six cases of double abductor paralysis seen by him, and in those on which a *post-mortem* examination was obtained it was found that the abductors were more degenerated than the adductors, and that in the nerve-trunks there were always some healthy fibrils left. While he had been observing these cases he met with a large number of instances of unilateral abductor paralysis due either to central lesions or to those involving the nerve-trunks. Stimulated by this experience he studied as far as he could recorded cases, and found that, while there were many instances of abductor paralysis due to central or nerve lesions, he could not find one authenticated instance of pure adductor paralysis. In 1880 both the English and German editions of Morell Mackenzie's first volume on "Diseases of the Throat and Nose" made their appearance—the latter translated and annotated by Semon. In the former, at Semon's suggestion, the author referred to the greater tendency of the abductors to suffer in cases of palsy, while in the German edition Semon wrote: "Even this view is not sufficient to explain the very remarkable phenomenon that in many cases in which undoubted central and peripheral lesions act on the whole nerve-trunk (above all, in cases of pressure on the recurrent by aortic aneurysm) only symptoms of abductor paralysis existed during life. While this has been observed both by author and editor in a number of cases, the latter knows of no instance in which after abductor paralysis had been observed during life, *post-mortem* examination has revealed disease of the whole nerve-trunk. This proclivity for the fibrils to the abductors to be attacked long before the others, and in many cases exclusively, is surely very striking." Thus, then, he wrote in 1880, and here we already have a tentative proposition, which required only further observation to elaborate it into a law. In the same year, but before the German edition of Mackenzie's book had appeared, Prof. O. Rosenbach, on the strength of a single case in which, owing to cesophageal

carcinoma, the recurrences were involved, and in which there was at first abductor, soon followed by complete paralysis, ventured to state: "Above all, the fact must be registered that in compression of the recurrent trunk the function of the abductors suffers first, and the adductors are only involved later." In this suggestion—for it cannot, in view of the fact that it rested upon only one case, be called more—we have a remarkable instance of an author hitting upon a great truth, if not by accident, at least without having worked up to it by the production of sufficient evidence. That he did not realise the full importance of his suggestion is shown *inter alia* by the fact that he only made it apply to cases of compression. To those who are interested in the matter I would recommend a perusal of the correspondence which passed between Semon and Prof. Rosenbach,¹ and also to the former's paper on "The Development of our Knowledge of Laryngeal Motor Paralysis since the introduction of the Laryngoscope."² To the mind of any unprejudiced reader it will be obvious that to Semon belongs the credit of enunciating and proving the fact that "in central and peripheral organic lesions of the motor laryngeal nerves the abductors only suffer, or at least do so earlier, and to a greater extent, than the adductors." This proposition, known as Semon's law, was the main outcome of two very important papers, one English and the other German, entitled "Clinical Remarks on the Proclivity of the Abductor Fibres of the Recurrent Laryngeal Nerve to become affected sooner than the Adductor Fibres, or even exclusively in cases of undoubted Central or Peripheral Injury or Disease of the Roots or Trunks of the Pneumogastric, Spinal Accessory or Recurrent Nerves,"³ and "Paralysis of the Various Fibres of the Inferior Laryngeal Nerve."⁴ As I have said, Semon's law was the main outcome of these two papers, but there were also other clinical points of great importance discussed, such as the occurrence of bilateral abductor paralysis in locomotor ataxia, and more particularly the relation of functional to organic laryngeal paralysis. It is almost impossible for the laryngologist, who began his studies after 1883, to understand the importance of this work to the clinician. As I have said, it used to be thought that it was very much a matter of chance in laryngeal paralysis

¹ "Forschungen und Erfahrungen," vol. i, p. 209.

² "Virchow Festschrift," vol. iii.

³ "Forschungen und Erfahrungen," vol. i, p. 1; and *Arch. of Laryngol.*, vol. ii, 1881.

⁴ "Forschungen und Erfahrungen," vol. i, p. 27; and *Berlin. klin. Woch.*, 1883, No. 46 *et seq.*

which muscles were affected. Owing to Semon's researches and observations, it became obvious that motor paralysis of the larynx might be central or peripheral, that the abductors and adductors might be involved, but that in organic disease the adductors were not primarily affected, excepting in some very rare cerebral cases, but that in purely functional cases the adductors alone were involved. Most of this was already adumbrated in 1883, although further researches were required to establish all the propositions just made, and I shall refer to them before collating the actual scientific and clinical value of Semon's work.

In 1885 the late Dr. Hooper, of Boston, called attention to the fact that in animals, when under the influence of very deep anaesthesia, stimulation of the recurrent laryngeal nerve caused abduction, instead of adduction, of the corresponding vocal cord, and that this phenomenon occurred even when the nerve was cut. Semon and Horsley¹ repeated these experiments, and published the results in a paper entitled "On the apparently Peripheral and Differential Action of Ether upon the Laryngeal Muscles." Their observations agreed with those of Hooper, but they drew the deduction that there was thus shown a difference in metabolism between the abductors and adductors—a point of great interest considering the proclivity of the former to suffer from the effects of disease as previously proved by Semon. They also found that in all animals used (monkeys, dogs, cats and rabbits), if the larynx was removed after death and the muscles stimulated separately, the posterior crico-arytenoids, although absolutely the largest of the laryngeal muscles, lost their excitability first.

In 1890 Semon published a very important paper "On the Position of the Vocal Cords in Man and on the Reflex Tonus of their Abductor Muscles." Partly from a consideration of the observations of others and partly from his own measurements and experiments, he arrived at the conclusion that in the majority of persons the vocal cords are almost stationary during quiet respiration, but that their position is considerably further from the middle line than after death. From this he drew the conclusion that the abductors are in a constant state of tonus, and are, therefore, actual and not merely accessory muscles of respiration.

In 1890 Semon, in conjunction with Sir Victor Horsley,² published the results of some most interesting and epoch-making

¹ "Forschungen und Erfahrungen," vol. i, p. 65; and *Brit. Med. Journ.*, 1886.

² *Trans. Roy. Soc. Lond.*, vol. clxxxi; "Forschungen und Erfahrungen," vol. i, p. 112.

experiments under the title, "An Experimental Investigation of the Central Motor Innervation of the Larynx," and again,¹ "On the Relations of the Larynx to the Motor Nervous System." These experiments confirmed, and at the same time extended, the observations of Krause and others, proving that in each cerebral hemisphere there is an area of bilateral representation of the adductors of the vocal cords, and that when this area is completely extirpated on one side no laryngeal paralysis results, while if the opposite area be stimulated complete adduction of both cords occurs. They discovered in the bulb a small concentrated focus, situated on both sides of the middle line, stimulation of which caused bilateral adduction of the cords, and outside of this on each side a small zone, irritation of which produced an inward excursion of the cord on the same side.

It is worthy of note that Semon and Horsley did not find, excepting in the cat, any cortical representation of abductor movements, although such representation has since been shown to exist in other animals by Risien Russell. They did, however, find that they could produce abduction by stimulating certain areas in the corona radiata and internal capsule, where they found the following representations from before backwards: (1) increased rapidity of respiration; (2) outward movement of the cords; (3) increased depth of respiration; (4) inward movement of the cords.

Let us now glance shortly at the clinical importance which attaches to Semon's law as regards the proclivity of the abductors to paralysis in lesions of the nerve-trunks and centres and to the deductions to be drawn from the joint experiments of Semon and Horsley.

Of course Semon's law was not universally accepted at first and many attempts were made to upset it. In the course of the discussions which followed, the great value of his work to the clinician became rapidly apparent. First and foremost, he had shown that in a lesion of the nerve-trunks or their medullary centres we may have, according to the completeness of the destructive process, either abductor paralysis or paralysis of both abductors and adductors, the cord being either fixed in the middle line or assuming the cadaveric position. He had proved, moreover, that abductor paralysis is a common condition. As the cord is then stationary in the position of phonation and usually gives rise

¹ *Deut. med. Woch.*, 1890, No. 31; "Forschungen und Erfahrungen," vol. i, p. 141.

to no symptoms, it follows that in doubtful cases the laryngoscope may throw much light on the nature of the lesion. It also resulted from his joint work with Horsley that for all practical purposes we may regard a unilateral adductor paralysis as impossible if we except myopathic conditions. Of course it is just conceivable that a case might occur in which injury has singled out the adductor fibrils in the recurrent nerve or somewhere in their course from the medulla to the recurrent, but such a contingency is highly improbable, as it has been looked for since Semon's early papers were published, and has in the thirty years which have elapsed only been met with in one case—that of Dr. Saundby, where, curiously enough, the condition seems to have been bilateral.

We have seen that from Semon's and Horsley's experiments it would appear that it is probably impossible for a one-sided cortical lesion to produce laryngeal paralysis. It is true that the experiments of Masini, Broeckaert and Katzenstein apparently point in the opposite direction, but the fact remains that no case has so far been recorded in which unilateral laryngeal palsy has been shown to depend upon a purely cortical lesion. Certainly cases have been noted in which unilateral paresis of a vocal cord has been associated with a cortical lesion on the opposite side, but in none of them have the medulla and nerves been shown to be free from disease, and without such proof, of course, they cannot be accepted. A very few instances are on record of bilateral cortical lesions producing double adductor paralysis, and such paralysis may conceivably be met with owing to morbid processes affecting the connections between the cortex and medulla. Putting such very unusual phenomena aside, however, we arrive at the result that laryngeal paralysis which involves the abductors (sometimes in association with the adductors, it is true) is due to organic disease, while motor paresis of the adductors is in the great majority of cases functional, more rarely myopathic and then commonly due to catarrh. This is certainly a most valuable generalisation, for which we are indebted to Semon and to his joint work with Horsley. I may perhaps venture here to refer to a case which came under my care, and which, had it not been for these observations, would also have come before a judge. A young lad was roughly seized by the neck by an irate householder whose bell he had been ringing, and from that moment lost his voice. On examination the well-known appearances of laryngeal adductor paresis were present, but neither electric nor any other treatment was effective in restoring the voice. The question of

damages then cropped up, but owing to Semon and Horsley's work, I was able to assure the angry father that the voice would return sooner or later, which it did in the course of some weeks, on the father, forgetting the boy's disability, roughly ordering him to call his brother.

I fear that owing to want of time I shall have to leave this very interesting subject of Semon's contributions—partly alone and partly in conjunction with Horsley—to our knowledge of laryngeal motor palsies. I trust, however, that I have made it clear that these contributions have resulted in entirely readjusting the ideas of laryngologists on this subject, and that they form the framework upon which our modern knowledge of motor neuroses of the larynx is based. I had hoped further to impress this upon you by comparing chapters from text-books written before and after the publication of our newer knowledge, but time presses, and I have still to do justice to—

SEMON'S WORK ON MALIGNANT DISEASE OF THE LARYNX.

In more or less direct connection with the case of the late German Emperor, which terminated fatally in 1888, much discussion anent laryngeal cancer arose. It would serve no purpose, and would be a breach of good taste, to revive the painful memories and the still more painful recriminations which resulted from this tragic case, more particularly as many of those who took part in the latter have passed to their last resting-place. We may, however, refer to some of the scientific questions which arose and which were elucidated in some measure as an immediate consequence of the imperial tragedy. It was asserted at that time that innocent laryngeal tumours frequently took on a malignant character as a result of endo-laryngeal operations. Now, as Semon at once recognised, this if uncontradicted would have given a death-blow to endo-laryngeal surgery, and he, therefore, set himself to combat the above view with his accustomed energy, and, so far as medical readers were concerned, with success. Those supporting the other view, however, unfortunately carried the correspondence into the columns of the lay press, where Semon and those who supported him did not consider it proper to pursue them. It was then that Semon devised a method by which this harmful doctrine could not only be scotched but killed outright. I refer to the collective investigation towards which he was fortunate enough to obtain observations from 107 laryngologists on 10,747 cases of innocent

growths, of which 8216 were operated upon by way of the mouth.¹ Among these there were 12 cases in which an innocent tumour seemed to take on a malignant character without any obvious cause, and 31 in which the same result was stated to have followed endo-laryngeal operation. While of the former many were doubtful, this also applies to 16 of the latter. The net result was to show (1) that malignant degeneration of an innocent growth is excessively rare; and (2) that putting aside for the moment the doubtful nature of some of the cases, and basing a conclusion on the figures as given, malignant degeneration would seem to have occurred relatively more frequently in the non-operated cases (12 in 2531) than in those operated upon (31 in 8216). Important as were the facts supplied by the various observers who sent in answers, the chief interest of the report rests upon Semon's own contribution, giving his observations on the early diagnosis of laryngeal cancer. It is not too much to say that here, as in the case of laryngeal paralysis, his work altered the whole aspect of the question. Hitherto it had been assumed by most writers that malignant disease comparatively rarely began in the vocal cords, while Semon, after an experience of 56 cases, arrived at the conclusion that of all parts of the larynx the cords were most liable to be attacked. I may say at once that the correctness of this conclusion will probably now be admitted by every laryngologist. Having arrived at this result, Semon's next undertaking was to attempt to catalogue the various points which would lead to recognition of the disease in the earliest stages. Most laryngologists are now familiar with the diagnosis of early epithelioma of a vocal cord, but all are probably not aware that we owe our knowledge of the subject entirely to Semon. I need not weary you with repetition of the details upon which so much depends in arriving at a conclusion as to the presence or absence of malignant disease, but I do venture to remind you of a few of the points of most importance—apart, of course, from the question of age—namely, (1) a tumour which may be very minute, and while it may be found in any part of the cord, is most commonly situated on the posterior third; (2) the presence of a greater amount of hoarseness than would probably be occasioned by an innocent neoplasm of similar size; (3) the growth surrounded by an area of congestion; (4) Increasing interference with the mobility of the affected cord. These were the main points upon which Semon laid stress, but I need hardly say that he amplified and

¹ *Internat. Centralbl. f. Laryngol.*, vols. v and vi; "Forschungen und Erfahrungen," vol. ii, p. 71.

qualified each of them with the most painstaking care. Nor need I tell you that these observations of his still remain the last important word which has been said on the diagnosis of early laryngeal cancer. He did not, of course, confine his observations to the disease in this situation and of this type, but here lay his epoch-making work. He wrote most wisely and well on the relative value of microscopic examination of a removed fragment, pointing out that too much importance should not be attached to such examination in the negative sense; he discussed age, heredity, pain, lymphatic swelling, hoarseness, dyspnoea, and dysphagia; and, in fact, partly by himself and partly with the assistance of the collective investigation results, supplied us with a most perfect monograph on laryngeal carcinoma. The pearl of great price, however, remained those sections which dealt with early diagnosis, for upon this depends the curability of the fell disease. I need not remind you as laryngologists of the fact, now so well recognised, that cancer in the larynx seems to remain shut off for a considerable time, and thus lends itself more readily to successful operative interference. We have seen that owing to the work of Semon the early diagnosis of the disease had become possible, and then the late Sir Henry Butlin revived the previously discredited operation of thyrotomy with complete and free removal of the affected parts. This operation had been discredited in all probability only because previous to Semon's publications malignant laryngeal disease was only recognised at a period when it had assumed proportions making any means of treatment short of complete extirpation well nigh hopeless. With early diagnosis, however, it soon transpired that thyrotomy was *par excellence* the method to be adopted for cases still in the initial stage. Soon after Butlin began to practise the operation Semon likewise adopted it, and in a short time became its most ardent champion. In 1907 he had operated on 25 cases, and was able to obtain a lasting cure in 80 per cent. It is rather curious to note that this operation, so successful in the hands of operators in this country, has been so slowly accepted by Continental surgeons and laryngologists. This is the more remarkable when we consider the excellent results it gives, not only in curing the disease, but in doing so with a minimum of interference with function, for, as you know, it is no uncommon thing for it to leave a voice very nearly as good as normal.

In addition to his great work on laryngeal carcinoma already referred to, Semon produced in 1897 very valuable papers entitled, "On the Question of Radical Operation in Malignant

Growths of the Larynx, with Special Reference to Thyrotomy"¹; "Some Points in the Diagnosis and Treatment of Laryngeal Cancer"² (in which he described his cases of thyrotomy already referred to); and "A Contribution towards the Diagnosis of Laryngeal Cancer."³ In these he amplified his previously expressed views, described and discussed the results of thyrotomy, comparing it with other operations, and related many interesting cases in which diagnostic difficulties arose, but he in no sense modified any of his original statements. This is very characteristic of his methods throughout, for, as I have before said, Semon was extremely accurate, and particularly careful never to generalise until he was absolutely sure of his facts and evidence.

While the late Sir Henry Butlin undoubtedly revived the operation of thyrotomy for certain cases of laryngeal cancer, and while he was quite alive to the value of this revival, it is uncertain whether the method would ever have become so widely known and appreciated had it not been for Semon's advocacy. The reason for this is not far to seek. Butlin, while an accomplished laryngologist, and one of our first authorities, if not actually our first authority, on malignant disease, was also a general surgeon with a wide range of interest and work.

His time was thus too fully occupied to enable him to concentrate attention on one particular organ, and so it came about that his new operation—for in a sense it was new—was brought into the position it merited by Semon, who, I need hardly say, was always most careful to draw attention to the originator.

Did time permit it would be a tempting task to draw a comparison between Semon's neurological work and that on malignant disease.

The former—considered purely from the scientific point of view—may be said to deserve precedence. It was slowly evolved, led to numerous laborious experiments, required much discussion, and finally placed the motor neuroses of the larynx in such a position that the chapters in all text-books had to be revised, or rather, I should say, rewritten. It made clear questions of diagnosis hitherto obscure, and in a sense aided therapeutics in so far that it enabled us to diagnose with more certainty between organic and functional disease.

¹ *Arch. f. Laryngol.*, vol. vi; "Forschungen und Erfahrungen," vol. ii, p. 284.

² *Brit. Med. Journ.*, February 2, 1907; "Forschungen und Erfahrungen," vol. ii, p. 338.

³ "Forschungen und Erfahrungen," vol. ii, p. 364, read in 1909 at the International Congress at Budapest.

Semon's observations on cancer were, on the other hand, purely the result of his experience, gathered, it is true, by the painstaking care with which he studied his cases, but resting upon no laborious laboratory experiments, and not entailing any elaborate histological study. It is true that here, too, an absolutely new light was thrown upon the early stages of malignant disease of the larynx, necessitating the revision of all that had been previously written upon the subject. Another and greater result, however, followed, for, owing to the early recognition of cancer of the larynx, many valuable lives have been saved in the past, are being saved in the present, and will be saved in the future.

As I approach the conclusion of my task I need hardly remind you that in what I have said no attempt has been made to provide a complete catalogue of Semon's contributions to the literature of laryngology. So far I have not mentioned that in 1884 he produced a translation into German of the second volume of Morell Mackenzie's work, which contained, in the form of annotations, much original matter. Again, no reference has been made to papers on the culture of the singing voice, on the relative merits of English and German medical education, and on unusual manifestations of syphilis in the upper air-passages—all interesting and valuable contributions. In addition to those, Semon also described many rare cases, supplied several articles dealing with biography, and wrote chapters for composite text-books, amongst which that on nervous affections of the larynx in Heymann's "Handbuch" deserves special mention. I will not, however, further specify individual articles, but content myself by stating that in all Semon was responsible for 132 contributions to literature. Since withdrawing from practice he has collected and published the most important of these in two beautifully got-up volumes. After mature consideration he decided upon German as the language to be employed in this his latest literary effort, but I am sure I voice the thoughts of many when I express the hope that an English edition of his collected works may yet become available.

When I began to arrange the material for these lectures I was very fully impressed by the importance of the occasion and the responsibility which I was undertaking. Gradually I became more and more conscious of the difficulty of fulfilling my task satisfactorily. To be unbiassed in discussing a friend and his work, to say enough and not too much, to touch upon controversial topics without giving offence—these were a few of the many stumbling-blocks which presented themselves to my mind, and

which, seeming small at first, eventually loomed large in my path. After arriving at the conclusion that the difficulties which beset me were legion, the question arose whether or not to fly to others for advice. On due consideration I arrived at the conclusion that the advice would vary so much according to the individual consulted that I could not hope to benefit by the collective wisdom of my friends.

I was, therefore, thrown back upon my own resources, and the result has been as you have heard. How very far short it falls of being worthy of this unique, this historic occasion, I am only too well aware (for Sir Felix Semon has been the recipient of quite an unusual honour in having a lectureship founded in his name while he himself is still alive). In conclusion, let me express the hope that he may live long in physical health and mental vigour, and be in a position to criticise the Semon lectures for many years to come.

REPORT FOR THE YEAR 1912 FROM THE EAR AND THROAT DEPARTMENT OF THE ROYAL INFIRMARY, EDINBURGH.

Under the charge of A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E.

PART II.

SOME NOTES ON SCARLET RED AS A DRESSING AFTER THE RADICAL MASTOID OPERATION, BASED ON THE OBSERVATION OF FIFTEEN CASES.

By THOS. W. E. ROSS, M.D., F.R.C.S.E.,
Clinical Assistant, Ear and Throat Department.

In this paper it is not proposed to enter upon the history of the use of scarlet red as a surgical dressing beyond stating the following facts: Fischer (1) in 1906 reported that the fatty dye known as scarlet red, if dissolved in olive oil and injected under the skin of a rabbit's ear, stimulated the epithelium to rapid growth. Iores (2) experimented further and found that the endothelium of lymph-vessels and of blood-vessels was also stimulated to growth. Schmieden (3) in 1908 first reported the application of scarlet red to the treatment of granulating surfaces in man. He used an 8 per cent. ointment and found that it stimulated squamous epithelium to proliferate by simple contact, injection of the dye into the tissues being unnecessary. He found that the

new epithelium proved thicker and more resistant to injury than normal epithelium. Microscopically all the layers of the normal epidermis were recognised in the new epithelium. Chemically, scarlet red is a combination of amido-azotoluol with β -naphthol. The former component was first used alone by Hayward (4) in Bier's clinic. He employed an 8 per cent. ointment and found the effect more marked than that of scarlet red. Amido-azotoluol has also been used by Grossman (5), of Berlin, for aural surgery, both in alcoholic solution and on specially prepared gauze.¹

Opinion as to the efficacy of these dyes as dressings in aural surgery is divided. At a meeting of the Berliner Otologische Gesellschaft, reported in the *Deutsche med. Woch.*, 1910, Grossman, Halle, Levy and Stein reported favourably on their experience with the dyes, whilst Hartmann, Beyer, Sonntag and Brühl had not found much advantage from the new dressing. But a number of these opinions were apparently based on an experience of the use of scarlet red in only one or two cases.

Dr. Logan Turner kindly allowed me to try this new dressing on those cases of radical mastoid operation which I have dressed in his wards since December, 1911.

Six cases were tried with amido-azotoluol, either in the form of an 8 per cent. ointment or a 4 per cent. alcoholic solution. These are not included in the following consideration, because in two of them the observations were incomplete and because two were tubercular cases. It may be stated, however, that the results were certainly much less satisfactory than with the scarlet red. This might be accounted for by some fault in the amido-azotoluol supplied. Grossman (6) lays stress on the fact that there are a number of makers of these substances, but in his experience only one or two particular products give satisfactory results.

Whilst a number of cases are still under treatment, I have a complete record of fifteen cases which down to the end of August of 1912 had been dressed with scarlet red.

An 8 per cent. ointment of scarlet red in vaseline was used. This was melted to a liquid state, and then sterile strips of ribbon gauze, half an inch wide, were dipped into it and transferred to a sterile glass dish, there to await use. All the cases were dressed at the time of operation with iodoform worsted, and this was generally allowed to remain *in situ* for four to five days.

In five cases (1 to 5) the scarlet red was applied after only one

¹ An interesting history of the use of these dyes is given by Grossman in the *Zeits. f. Ohrenh.*, 1910, and also by Davis in the *Annals of Surgery*, 1911.

or two preliminary dressings with bismuth gauze. In these cases the average time taken for the whole surface of the bone-cavity to be covered by granulations was fourteen days, and the average time for complete epithelialisation of the granulating surface twenty-one days. Thus the average time from date of operation to date of complete epithelialisation was thirty-five days and a fraction—practically five weeks. In the remaining ten cases (for reasons stated later) the red ointment was not applied till the bone-cavity was completely covered with granulations. Until this occurred bismuth gauze was used as a dressing, applied usually every second day. This period in these cases averaged fifteen days, but the average was raised by two cases taking twenty-five and nineteen days respectively to reach this stage. Reference will be made to these later. The shortest period noted for complete granulation was nine days from date of operation. The average time of epithelialisation of the fully granulated surface was twenty days, the individual periods varying from twelve to thirty-two days. The average period from date of operation to complete epithelialisation was thirty-six days.

It will be seen that it has apparently made little difference to the final result whether the red was applied in the first instance to bare bone or to a surface covered by granulations, but in the second series two cases were prevented by complication from healing quickly.

In Case 14 the posterior wound was kept open for twenty-five days as a septic lateral sinus thrombosis had to be dealt with. A large portion of the internal jugular required resection and the bulb was syringed through twice daily for two weeks. This case was dismissed, healed in forty-four days from the date of the first operation.

In Case 15 the posterior wound was infected by the patient's own finger, and it took nineteen days to get the cavity into a healthy healing condition. Allowing for these cases, it seems that the stage of complete granulation is reached a little more quickly by the use of bismuth gauze packing, and certainly there is less tendency to exuberance of granulation and to excess of discharge if that dressing be used so long as any considerable area of bone is bare of granulations.

If the application of the red ointment be delayed till a healthy granulation surface be present, little or no increase of discharge and no undue tendency to exuberant granulation is noticed. For these reasons it seems desirable to postpone the application of the

red ointment until the granulation of the cavity is at least nearly complete.

Considering the fifteen cases together the average time taken to obtain complete healing was a fraction over thirty-five days, practically five weeks.

Three cases (1, 9, 11), were completely epithelialised in under thirty days, the shortest taking twenty-five days. Six cases occupied forty days or over, the longest taking forty-four days. This latter group included two cases suffering from the complications already mentioned; three cases (5, 7, 13) with persistent Eustachian discharge, favouring the presence of unhealthy granulations in the tympanum, and one case (6) whose tissues seemed to be unusually sensitive to the red. In this last case there was a marked tendency to excessive discharge after the application of the red and a persistent tenderness of the cavity. A slight temporary increase of discharge after the first or second dressing with red is not uncommon.

In the majority of the cases the red ointment has been applied for twenty-four hours, and then a dressing of bismuth gauze or gauze impregnated with eucalyptus vaseline substituted for twenty-four hours. But in cases which tolerate the red well (*i. e.* where no marked increase of discharge is provoked and there is no undue tendency to granulation), the best results in this series have been obtained by forty-eight hours' application of the red followed by twenty-four hours' packing with bismuth gauze. In the later cases eucalyptus vaseline was not used as the alternative dressing until epithelialisation was well advanced.

The prompt application of silver nitrate to any exuberant granulations is important. In cases which are going to do well very little caustic is needed. In five cases (1, 9, 10, 11, 12), whose average time of healing was a fraction over thirty days, no caustic was required at all.

In five cases Eustachian discharge has been marked; in four of them (5, 7, 8, 13) it interfered with the rapid epithelialisation of the cavity. The discharge ceased soon after complete epithelialisation in three cases, and in two (7, 13) persisted after the cavity was covered with epithelium.

In five cases some tendency to a filling up of the cavity was noticed. In Case 1, a young girl, the tympanic cavity was practically obliterated by firm tissue which completely shut off the Eustachian tube. In spite of this a slight improvement in hearing was noted. In Case 2, also that of a child, a marked filling

up of the tympanic cavity threatened to lead to the formation of a pocket communicating with the Eustachian tube at its inner end. The Eustachian tube discharged freely for some time, but as soon as this discharge diminished the pocket gradually filled up, the tympanic cavity became obliterated, the orifice of the Eustachian tube being occluded by firm tissue. This case was a deaf-mute.

In two cases (8, 15), both adults, a tendency to narrowing of the deeper portion of the cavity was evident towards the end of treatment and after its completion. These cases were seen two to three months later, and it was noted that the thickening of the soft tissues which produced the narrowing had quite disappeared.

In one man (Case 7) some narrowing of the deep portion of the cavity occurred and still persists, but there is no pocket. A narrow passage leads to the Eustachian orifice and from this there is a persistent discharge, which is now, however, beginning to diminish. Any undue tendency to filling up of the deeper portion of the cavity can best be overcome by the free use of silver nitrate, by reduction in the period of application of the red ointment, and by firm packing with bismuth gauze.

With regard to hearing in these cases, it may be stated that in eleven there was decided improvement. In one case (6) it remained *in statu quo*, in one case (7) it was considerably diminished, namely, from raised whisper at fifteen feet to raised whisper at two feet. Two cases (2 and 9) suffered from practically complete nerve-deafness before operation.

The chief points in this method of treatment may be summarised as follows. To avoid (as far as possible) the formation of exuberant granulations, bismuth packing should be used till the bone surface is covered with granulations. The red ointment should then be applied for periods of forty-eight hours, with intervals of twenty-four hours, when either bismuth gauze or gauze impregnated with eucalyptus vaseline should be used for the dressing, the later preferably in the latter stages of epithelialisation. A temporary increase of discharge after the first applications of the red is often to be expected, but should this increase be excessive and tend to persist, then the periods of application should be shortened to twenty-four hours and the intervals lengthened to forty-eight hours or even longer. A similar modification of treatment is called for in cases where there may be persistent increase of tenderness following the use of red. This occurred in only one case out of fifteen in this series. If exuberant granulations appear they should receive a prompt application of silver nitrate. They

are apt to be most troublesome in the tympanum, especially when Eustachian discharge persists.

It is precisely in those cases where one meets the above-mentioned conditions that there may sometimes be noticed a tendency to undue filling up of the operation cavity in its deeper part. Hence the importance of attention to these details of treatment.

If the process of filling up has not gone beyond a narrowing of the deeper portion of the cavity, it will be found that the thickening of the soft tissues diminishes a few weeks after the cavity is healed, and that the narrowing disappears.

The results of treatment in this series of cases seem to show that with the use of scarlet red complete epithelialisation is to be expected within six weeks. In the majority of cases the period may be within five weeks, and a few specially responsive cases may be completely healed in four weeks, or even in a day or two less.

The contour of the cavity is usually well maintained, and the lining epithelium is strong, with little tendency to desquamation. Operation cavities, seen several months after healing is complete, appear very clean.

The chief disadvantage of the method is that it requires careful supervision. The indiscriminate or careless use of scarlet red would certainly lead to the production of exuberant granulations, the formation of pockets, and perhaps an undesirable filling up of the deeper portion of the operation cavity.

REFERENCES.

- (1) FISHER.—*Munch. med. Woch.*, Nr. 42, October 16, 1906, p. 2041.
- (2) IORES.—*Ibid.*, Nr. 18, April 30, 1907, p. 879.
- (3) SCHMEIDEN.—*Zentralbt. f. Clin.*, Nr. 6, 1908.
- (4) HAYWARD.—*Munch. med. Woch.*, 1909, p. 1836.
- (5) GROSSMAN.—*Zeit. f. Ohrenh.*, Wiesb., 1910, xi, pp. 10-23.
- (6) GROSSMAN.—*Deutsch. med. Woch.*, 1910, p. 777.

THREE FATAL CASES OF PNEUMOCOCCAL INFECTION OF THE THROAT.¹

BY ALEX. R. TWEEDIE, F.R.C.S.,
Assistant Surgeon, Nottingham General Hospital.

THESE notes are reported in order to place on record a clinical condition which I have otherwise not seen, and the mortality of which, in my hands, at any rate, is 100 per cent. Possibly they may belong to that class referred to in the *British Medical Journal*, June 26, 1909, by Sir Felix Semon, whose very graphic account there would, in many respects, form an accurate description of my own cases.

The two first patients may be regarded as representing the asthenic, and the third as the sthenic type of the disease; the former were "chronic" conditions almost to the last, whereas the latter ran a comparatively rapid course from its commencement up to the end.

All three were characterised by their absolute lack of response to every kind of general or local treatment employed, and no cause or connection—apart from the presence of the pneumococcus in the throat—could be ascertained. This organism was present in large numbers in pure culture on the swabs or sputa.

There was no apparent ulceration of, nor membranous deposit on, the mucous membrane concerned, which was, however, intensely injected and oedematous at the commencement of the illness.

The main focus of the local lesion in each case appeared to the naked eye as an indolent, necrotic, more or less localised, sloughing area quite distinct from any pathological state usually associated with the term "abscess."

Up till the last few days of the disease there was no impairment of appetite or malaise corresponding with the progressive weakness, raised temperature or severity of the disease generally.

CASE I.—Mrs. D—, aged forty. First seen by me in consultation with her doctor March 23, 1911. She had been quite well till the end of November, 1910, when one day "the throat began to be sore."

On examination the nose appeared healthy; the teeth were all replaced artificially; the tonsils were not enlarged, but suggested attacks of past tonsillitis; the naso-pharynx was healthy and the ears intact. The laryngoscopic picture showed very marked infiltration of the arytaenoid areas and intervening space, the left side apparently being more affected than the right. The left v. c.

¹ Yet another apparently similar patient under my care at present suggests eventual recovery, mainly I think due to gastrostomy and tracheotomy. I hope to publish a detailed account of this case at an early date.

was immobile, the right active but weak. There was a large accumulation of muco-pus in the pyriform sinuses and over the upper edge of the posterior boundary of the aditus laryngis.

On inquiry I learnt there had been some dysphagia for the last three months, and that now she had some difficulty in swallowing liquids.

She had been married sixteen years, but had never been pregnant, and nothing in her history could be discovered pertinent to the case.

I diagnosed tubercular perichondritis, or rather agreed with the opinion which had already been given.

I heard no more of the case till the end of the following May, when I was told that no physical signs of tubercle could be found in her chest nor tubercle bacilli in the sputum, but that the discharge from the larynx was now much more profuse and abounded with pneumococci. A phlegmonous condition of the neck had preceded this increase of the discharge. I saw her again some three days later; she said she had improved during the last week. The larynx appeared very much as before, except that about the centre of the upper edge of the posterior boundary of the larynx there was a local condition which suggested the presence of a sinus, careful swabbing, however, failed to corroborate this, nor did the probe detect any bare cartilage. There was a localised emphysematous patch over the region of the right crico-thyroid joint, palpation of which was followed by an expectoration of muco-pus. She could swallow about a teaspoonful at a time and was being fed *per rectum*. I considered that there was a localised necrosis of the cricoid cartilage; but on account of her general condition, ease of expectoration and apparent improving state advised temporising. The sputum, on examination again, was found full of pneumococci.

I heard no more of her till her death was reported on July 2. Up till the last her doctor stated that he thought she was going to get well. The expectoration and dysphagia had ceased, she could take two pints of milk daily in addition to the rectal feeds, so that nasal feeding, which had been discussed, was not thought necessary. Some twelve injections of autogenous vaccine were given, with no effect whatever, except that at first she stated she felt much better. About three days before her death she began to collapse, and died apparently from "heart failure."

CASE 2.—Mrs. H—, aged thirty-four. First seen by me in consultation, June 19, 1912. She had had a husky voice some three or four days, with an increasing phlegmonous condition of the neck, chiefly confined to the left side.

Nothing abnormal could be seen either in the nose, pharynx, post-nasal space or ears. In the larynx the left ventricular band and the mucous membrane anterior to and above it were swollen, so that the vocal cord on that side was obscured except on phonation. The right side was apparently not involved, and the movements were normal on both sides. There was a brawny swelling of the front and sides of the neck, most marked over the left thyroid ala and adjacent portion of the sterno-mastoid.

Incisions made within four hours revealed no naked-eye pus, although there appeared to be a cavity over the left side of the thyroid cartilage.

The sputum contained pneumococci.

For the next month she seemed to improve. The incisions in the neck tended to close, and the discharge from them became purulent, as one would expect. Her temperature at night was up to 100° F. The swelling inside the larynx became wrinkled on the surface, suggesting subsidence, and her appetite improved.

At the beginning of July her general condition was worse, the laryngeal discharge more copious and the neck more swollen. Further surgical relief was advised, but declined by the husband, who, against the wish of both her doctor and

myself, took her to Dovercourt. Here, in spite of bracing sea air and very careful medical attention locally, she steadily lost ground, and eventually returned home on August 15. I saw her the following day. Her general condition was very much worse; the wounds in the neck were indolent, dirty sinuses, and that over the left thyroid ala communicated with the pharynx or œsophagus. The larynx was almost obstructed by a very much increased swelling of the parts originally involved.

The case was obviously desperate, and the only chance to offer was that which might follow vigorous surgical treatment.

This having been consented to, the patient was admitted to the Nottingham General Hospital. Under intra-venous ether, tracheotomy—the necessity for which almost at once became urgent—was performed; the thyroid was then split in the middle line, so as to examine for necrosis of cartilage, which I thought was present. No bare cartilage was found, but the lumen was almost obliterated by the extreme œdema of the mucous membrane. A rubber tube was therefore laid in to maintain an air-way, and the thyrotomy wound closed over it. The sinus on the outer aspect of the thyroid on the left side was explored, and a roughly circular hole exposed towards the centre of the posterior margin of the cartilage leading into the pharynx. This was thoroughly curetted, swabbed with iodine, and the soft tissues united over the opening with catgut. The remainder of this wound was again treated with iodine and packed with gauze. The patient was put into a tent with a bronchitis kettle, and continuous rectal saline injection ordered. The next day the tracheotomy tube was removed, but, apparently owing to the occlusion of the upper opening of the laryngeal tube by the swollen mucous membrane, it was necessary to replace it. The indolent necrotic appearance of the outer wound showed no reactionary sign. On the whole, she was more comfortable and looked rather better.

The following day—July 19—she was obviously weaker and she died in the afternoon.

[I think it would have been better treatment not to have opened the larynx but to have merely put in a tracheotomy tube, cleaned the external wound and passed a catheter through the pharyngeal fistula into the œsophagus, and thus have had an easy method of feeding.]

CASE 3.—S. W——, aged thirty-four, a robust, otherwise healthy man, by trade a fitter, was admitted to the Nottingham General Hospital, October 24, 1912. He stated he had been suffering with a “sore throat” for three weeks, which, during the last three days, had become much worse. He did not look particularly ill. The nose and naso-pharynx were structurally normal, but the seat of a more or less generalised subacute naso-pharyngitis. The teeth, with a few exceptions were in good order. Both tonsils and the adjacent peritonsillar areas were injected and swollen, but no ulceration or membranous deposit was anywhere to be seen. There was a brawny cellulitis of both submaxillary and submental regions, rather more pronounced on the right side. For the first three days after admission he “took” well, and in addition had malt and cod-liver oil, also a quinine mixture. At the same time he very freely and constantly used a nose-wash and a gargle, whilst continuous fomentations were applied to his neck. On the fourth day there was rather more swelling around the right tonsil, so a very free incision was made in the soft palate immediately above it; no pus was seen, but, as is often the case the patient volunteered that he had a great deal of relief therefrom. Up till now no record higher than 101·6° F. had been noted, but thence onwards the temperature varied between 101° and 104·2°, the chart being very similar to that of many cases of pneumonia. Meanwhile the swelling in the neck steadily decreased. He

gradually passed into a semi-delirious state and from that into progressively increasing coma and died on November 2.

The pathological report of the swab from the throat was that it consisted in a pure culture of pneumococci. Of this an autogenous vaccine was prepared and two injections given without any apparent effect whatever.

Post-mortem.—A small neurotic area about half an inch in diameter was found in the depths of the right submaxillary lymph-glands, with which was associated no obvious local reaction or collection of pus; it rather appeared as a piece of moist, sloughing tissue in the midst of a generalised cellulitis. Examination of the blood and cerebro-spinal fluid taken after death proved sterile.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

November 1, 1912.

MR. HERBERT TILLEY, *President of the Section, in the Chair.*

Mikulicz's Disease.—**James Atkinson, M.B.**—Male, aged thirty-three. Symmetrical swellings of both parotid glands. Submaxillary glands are distinctly swollen; lachrymal glands not visibly enlarged, but there is undue lachrymation. Glands are felt to be enlarged in posterior triangles of neck and in occipital regions. There is no pain or tenderness. Swellings of parotids first noticed ten months ago. The liver is enlarged, but there is no enlargement of spleen to be detected. Patient is liberal in his allowance of alcohol.

Dr. D. R. PATERSON had taken an interest in this disease from the time Mikulicz first described it, and the first case of it he saw in this country was one shown before the old Laryngological Society. He did not know that this present case could be so described, as there was only one salivary gland definitely asymmetrically affected—namely, the parotid. The other salivary glands were doubtful, and the lachrymal gland could not be felt. On the other hand, there was considerable enlargement of the lymphatic glands of the neck. In the first cases of the condition described by Mikulicz the affection was confined to the secretory glands, and unless the conception of the disease had been extended this case would hardly come under that category.

The PRESIDENT (MR. HERBERT TILLEY) said that Osler had described a case in which it was found after death that the lachrymal gland had become fibrous, and there had been a history of its enlargement earlier in the case. If it was thought that Dr. Atkinson's case was lymphadenoma the microscopic examination of a portion of the gland would enable such a diagnosis to be made. The effect of arsenic might be tried in this patient.

Dr. KISCH said the case was of interest because of the enlargement of the lymphatic glands. The disease was supposed to have some relation with lymphadenoma, but in most of the published cases no enlargement of glands was mentioned. In this case both submaxillary glands were enlarged.

Dr. ATKINSON, in reply, said there was considerable enlargement of both submaxillary glands, and also, he believed, of the sublingual glands. The urine was normal, and there were no enlargements in the general lymphatic system of the body.

Fibroma of the Naso-pharynx.—**Herbert Tilley, F.R.C.S.**—Male, aged twenty-one, applied to the Radium Institute in order that a tumour in the right nasal cavity should be treated by radium, because he had been told that the case was inoperable. Examination showed that the right nasal cavity was filled by a firm vascular mass, which reached from the vestibule in front to the naso-pharynx behind, where it filled and slightly projected from the posterior choana. The patient was anæmic, but otherwise his health was good. The patient was admitted and operated on. Preliminary laryngotomy was not performed, as I hoped to be able to plug the post-nasal space securely with a sponge, but it was necessary to open the wind-pipe during the operation because of the severe bleeding and difficulty of administering the anæsthetic. Free access to the nasal fossa and the growth was obtained by turning up the right cheek and upper lip and removing the ascending process of the maxillary bone. The tumour was vascular although tough, and it grew from a broad base, which appeared to include the posterior ethmoidal cells and the lateral walls of the naso-pharynx. It was removed by cutting close to its base with strong scissors and partly by means of a strong wire snare which could be slowly tightened up. Bleeding was free, and transfusion was employed when the patient was returned to bed. He made an excellent recovery, and on one occasion I made four deep punctures with the galvano-cautery into what seemed to me a small recurrence in the base of the growth: this has disappeared, and since the patient is twenty-one years of age I do not anticipate further trouble. The pathologist's report states that the growth was of a fibrous nature, contained large, thin-walled blood-vessels, and in several regions cysts were situated, in some of which evidences of old hæmorrhages were present.

Specimen of Large Fibroma removed from Patient some seven years ago.¹—**Herbert Tilley, F.R.C.S.**—Four extensive operations were necessary, but the patient is to-day alive and well, and is a picture of robust manhood. The interesting feature in this case was the fact that a large portion of the tumour grew from the posterior wall of the antrum, and it was from this region that recurrences took place after the first operation.

Dr. WATSON-WILLIAMS said the growth was approached through the anterior route, and he urged that anterior routes, either by this method or in that which he had himself advocated—namely, splitting the nose and turning out an osteoplastic flap, with removal of the posterior part of the nasal septum—a method of approach which gave a very complete view and control of the area involved, gave more perfect access than the more usual splitting of the soft and partial removal of the hard palate. Sometimes one was inclined to overlook the advantages accruing from an anterior route.

Dr. FITZGERALD POWELL said that tumours such as this, which had probably their origin in the nose, and had not extended very far into the naso-pharynx, were easily approached from the front by this method, but where the tumour was large, involving the basi-sphenoid, and, as in a

¹ *Vide* JOURN. OF LARYNGOL., RHINOL., AND OTOL., 1911, xxvi, p. 213.

case of his, extending along the pterygoid process, he thought it would be found necessary to perform an osteoplastic resection of the upper jaw or do the modified form of Nélaton's operation, splitting the palate and removing a portion of the hard palate if necessary. For a small tumour the method adopted by Mr. Tilley seemed to be preferable. Many of these tumours in the nose and naso-pharynx showed malignancy, and he thought from the recurrence that there might be a sarcomatous factor in this case. The difficulties found and described by the President indicated the necessity for a preliminary laryngotomy, which should always be performed.

Mr. HARMER recalled a case of a large nasal fibroma, which he reported some years ago to the Clinical Section, which gave the patient a frog face and displaced both eyes outwards; the tumour was very vascular and pulsating, and several London surgeons pronounced it to be inoperable. He first did a laryngotomy, and temporarily ligatured both external carotid arteries, and then the whole tumour was taken away, almost without bleeding. The arteries were gradually released afterwards, and bleeding points dealt with as they appeared. In such cases the question of such temporary ligature should be considered.

Mr. E. D. DAVIS said that it was stated that fibromata arose from the perichondrium or the plate of cartilage between the basi-sphenoid and the basi-occiput, and that such fibromata did not recur after ossification of that cartilage about the age of twenty-five.

Dr. WESTMACOTT had had a similar case in a boy, aged sixteen, in whom the growth originated from the posterior ethmoidal region. There was first enlargement of the inferior turbinal and some protrusion of the cheek, pointing to invasion of the antrum. On removing the turbinal he found a good deal of polypoid material in the antrum and in the middle turbinal region, which was cleared out. Five months later the patient returned with the nose filled by a solid mass. He again operated. He found he could not remove the mass, as it was so hard and the hæmorrhage was so profuse: after getting away as much as he could with the snare and very strong scissors, he had to leave it. He saw the patient again only a few days ago and found the nose was filled with a large single growth. The question was whether he should do a formidable operation to remove it or leave it alone.

Dr. D. R. PATERSON had been under the impression that fibroma originating within and confined to the antrum was a rare condition, but at the 1912 meeting of the German Laryngological Society at Hanover, he saw three specimens of fibromata of some size which Manasse had removed from the interior of the antrum.

Dr. DUNDAS GRANT said that if these growths were attacked before they became very large, much could be done by passing a raspator through the nares and detaching the periosteum from the bone, vigorously guiding by a finger in the pharynx. The growth could then be got away with much less hæmorrhage than might be expected. In a notable proportion of the cases exhibited at this Section, the growths had their origin in the antrum. He had himself described one case in which it was possible, with the finger in the pharynx, to feel the adventitious opening in the inner wall of the antrum through which the mass protruded.

Mr. HORSFORD asked if the method had been tried which was known as the per-oral method. He had seen this used in Berlin.

The PRESIDENT, in reply, said he would not split the soft palate for such a case if he could gain good access to the growth otherwise. One obtained this through the nose by turning up the cheek by an incision in

the gingivo-labial fold, and removing the ascending process of the superior maxilla and cutting through the floor of the nasal septum; the whole of those structures could be turned upwards, so that the tumour was fully exposed. In this case the microscope revealed no sarcomatous elements. With regard to preliminary laryngotomy he thought he might manage without it, but the bleeding was very free. In the midst of the operation, as the boy was becoming faint, and there was difficulty in administering the anæsthetic, he put in a laryngotomy tube: he would in future put one in first of all, even though it might prove afterwards not to have been necessary. Mr. Harmer's suggestion as to ligation of the carotids was valuable, but he had not yet seen the need of that procedure. In this patient there had been a recurrence in the postero-lateral part of the nasal fossa, which had appeared in less than a month. During the past month he had punctured it on two or three occasions with the galvano-cautery, and already there was a distinct diminution in the size of the swelling. In reference to Mr. Westmacott's case, he suggested that he should try Vottolini's method, or electrolysis, for in America cases had been reported in which large growths had been cured by electrolysis and practically without any loss of blood. Or the galvano-cautery loop could be tried. In any future case of his own of this character he intended to try the galvano-cautery, as the experience he had had with this class of case was very trying; this particular patient was so weak after the operation that it was thought wise to transfuse him. Dr. Grant's suggestion would not be practicable in such a case as this, for it would necessitate working more or less blindly. He had brought the bottle specimen of another case of large naso-pharyngeal fibroma because it was in reference to this case that Dr. Bryson Delavan had made some very uncomplimentary remarks when speaking on this subject before the American Laryngological Association.¹ Dr. Delavan not only condemned the method of operation, but inaccurately recorded the history of this case, the operative details, and left the reader to understand that because there was no recurrence within three months the patient was therefore reported "well." As a matter of fact the history of the patient from whom this growth was removed was that day "quite well." He stood 6 ft. 2 in. in height, a picture of health, and was in the South African Police. The recurrence took place from that part of the tumour which grew from the posterior wall of the antrum, and when that was removed at the fourth operation no further growth took place.

Photographs of a Patient suffering from a Chondro-Sarcoma, originating in the Left Nasal Cavity.—Herbert Tilley, F.R.C.S.—Female, aged sixteen, consulted me on July 7, 1910. Her only symptom was inability to breathe through the left nostril. Examination showed the left nasal cavity completely filled with a smooth firm growth which closely resembled a cystic enlargement of the middle turbinal. It reached from just within the vestibule to the posterior choana, and a probe could not be passed between it and the surrounding parts. Exploration showed that it was a solid growth. The antra were clear on transillumination. Septum much deflected to right. She was admitted into University College Hospital, and the growth fully exposed by turning up the upper lip and left cheek and removing the ascending process of the left maxillary bone. Care was taken to try to remove the

¹ Vide "Transactions of the Twenty-third Annual Meeting of the American Laryngological Association," 1911, pp. 16, 17.

growth *in toto*, but it was very friable and of the consistence of a hard frozen ice-cream, and the site of origin could not be ascertained. Every trace of it was removed, and the patient rapidly recovered, but in a few weeks recurrence was noted.

During my illness Mr. Hett operated again, and found the growth had penetrated the septum and destroyed some of the right ethmoidal region. Recurrence again took place, and the patient consulted other surgeons,



Chondro-sarcoma of the nose.

who did not advise operation. The photographs were taken towards the end of July, 1912.

Bilateral Œdema of Nasal Septum.—J. F. O'Malley, F.R.C.S.—

Case 1.—Female, aged twenty, cigarette-maker, came complaining of her nose getting broader and of inability to breathe through it. The sense of smell was absent. On examination polypi were seen on both sides, with a septal deflection to the left. A submucous resection was done, and the polypi removed. The latter are recurring, but the bilateral septal swellings which were previously observed remain practically the same. The septal cartilage, bone, and periosteum were healthy, and the œdema was apparently limited to the mucous membrane.

Case 2.—Male, aged eleven, came to hospital because his nose was getting broader and that he could not breathe through it. The left nasal fossa is completely blocked with a pale red, soft, mobile mass. It lies in the centre of the passage, with a cleft on each side of it. A probe passed along the inner cleft is soon stopped against the base of the swelling on the septum, but the outer cleft is permeable. The condition on the right side is similar, only less pronounced, as the junction of the base of the swelling and septum can be more easily seen. The middle turbinates are pushed up against the outer wall of the middle meatus.

Mr. CLAYTON Fox said these cases might be placed in the same category as œdema and hyperplasia of the tubercle of the septum.

There was in such cases a large amount of glandular tissue, some lymphoid, and possibly cavernous tissue present. The slighter cases could be dealt with by the galvano-cautery, and the more pronounced either by shaving or lateral incisions followed by gauze packing.

Dr. DAN McKENZIE said those cases formed two further instances of a condition which was really due to ethmoidal disease. Last year he showed a similar case, in which there was œdema on both sides of the nasal septum; and this was not uncommon in ethmoidal suppuration. Probably the same cause which induced the polypi from the middle turbinal also produced the œdema of the upper part of the septum. In these cases the œdema seemed to be limited to the upper part of the nasal septum—namely, the bony part.

The PRESIDENT said he had a private case in which similar appearances were present, not only on the “tubercle of the septum,” but there was a distinct prominence on the floor of the nasal meatus, very like a polypus growing from the nasal floor.

Denker's Operation for Maxillary Antrum Suppuration.—Dan McKenzie, M.D.—Girl, aged nineteen. Nasal discharge (right side) of over one year's duration. Usual signs of antrum suppuration. Pain in face over right antrum present. Denker's operation three months ago: cure. The essential feature of the Denker operation is the removal of the anterior bony angle of the antrum, so as to render continuous the openings in the canine fossa and in the nose. In this case the operation was performed through the mouth under chloroform. After-treatment is enormously facilitated by the ease with which the antrum can be drained and washed out; one can look straight into the antrum on anterior rhinoscopy. There is a somewhat serious drawback to the operation. Cases have occurred (I am told) in which, subsequent to the operation, cicatricial contraction has induced displacement of the ala nasi on the operated side. There is no sign of deformity in the present case.

The PRESIDENT said there were two reasons why this operation might not be the best for general adaptation. First, similar good results might be obtained by simpler measures; and, secondly, he knew of one case in which stenosis of the lachrymal duct had occurred which necessitated probing of the duct for several months.

Dr. D. R. PATERSON said he had done this operation for some time, usually for growths in the nose. He had done it a few times for ordinary chronic suppuration of the maxillary antrum, and they had all done well, and with no resulting deformity of the ala.

Dr. McKENZIE, in reply, said it did not strike him as a very large operation. The possibility of interference with the nasal duct was obvious, though he did not think it was greater in Denker's operation than in others.

Tuberculosis of the Tonsils and Cervical Lymphatic Glands.—Dan McKenzie, M.D.—This little boy came under treatment for “enlarged tonsils and glands in the neck” about nine months ago. The tonsils were enucleated and examined for tuberculosis. The microscope showed plentiful giant-cell systems in the left tonsil, with a few in the right. The lymphatic glands on the left side of the neck are more affected than those on the right. The patient is being treated by tuberculin. The case is of special interest for two reasons: First, it exemplifies one of the two types of tonsil tuberculosis to which attention was drawn two years ago in a discussion at the Section, that, namely, of the

disease in the substance (and not on the surface) of the tonsil; there is no ulceration; it is associated with enlarged cervical glands, and it occurs in a child. In the other variety the tuberculosis is ulcerative, superficial, secondary to pulmonary disease, and occurs in adults. The second point of interest is that the case emphasises the importance of enucleating the tonsils when the cervical lymphatic glands seems to be tuberculous.

The PRESIDENT said he had seen a case where there were enormous tuberculous glands, and operation had been refused by a surgeon because extensive cicatricial contraction in the neck would ensue. Tuberculin was given for six or eight months, and the glands had practically disappeared.

A Simple Tonsillotome.—James Donelan, M.B.—This tonsillotome has been designed by the exhibitor as an improvement on one introduced by him some fourteen years ago (also shown), which was a modification of the original instrument of Morell Mackenzie. This modification consisted in the removal of the upper of the two parts of the slit ring between which the blade finishes the cut. At the same time Mackenzie's rounded edge was given a pointed form. The new instrument has been devised with the idea of getting rid of everything except the really essential parts. It consists, really, of only two portions if, as recommended, the handle be supplied as a fixture. The blade can be rapidly detached and the holder quickly and thoroughly cleaned. The handle has been fixed at the angle recommended by Dr. Kelson. It has, however, been thoroughly tested in several operations and has proved quite satisfactory.

Dr. J. DONELAN said he had used it in twenty cases. It caught the tonsil very effectually when it was cut. It was not intended in any way in opposition to the modern revival of the operation by enucleation, but in the large majority of primary tonsillotomies, especially in children, he believed the old operation would continue to be practised, and that this instrument would be found to possess the merits claimed for it in the description given.

Epithelioma of the Soft Palate.—Francis Muecke, F.R.C.S.—Male, aged forty-four. Hard, warty, ulcerating growth on soft palate just behind and above third left molar tooth of jaw. The size was slightly less than that of a threepenny-bit. The edges were raised and indurated. History was indefinite; the ulcer had been noticed for about three months, and had caused a little pain. A small piece was removed for examination, and the report was: "Squamous and horny carcinoma in early stage." The anterior triangle of the neck was completely cleared, and all glands, including the submaxillary, were removed. A laryngotomy was then performed for anæsthetic purposes, and the upper part of the pharynx plugged. The growth was freely and boldly removed, allowing about $\frac{3}{4}$ in. radius. Bleeding was profuse. The cut edge of the soft palate was approximated by stitches to cut edge of the anterior pillar, and the deep wound firmly plugged to prevent hæmorrhage. Next day the plug was removed, and no hæmorrhage resulting, the laryngotomy wound was closed; healing was rapid and satisfactory. Microscopic section shown.

Double Adductor Spasm, caused by Vocal Overstrain (?).—Francis Muecke, F.R.C.S.—Male, aged thirty. First seen in July last,

when he came to hospital with complete loss of the singing voice and painful and husky speaking voice. Onset was gradual. First noticed loss of high notes, then pain after singing, and then husky voice, till he had no voice whatsoever, the total process lasting seven months. The laryngoscope showed the cords closely approximated in the middle line; they were curved, so that their anterior and posterior extremities almost touched; both cords were red and injected. No outward movement took place on deep breathing. Complete rest was ordered. He has since been seen on five occasions, and the local conditions have altered somewhat on every occasion; sometimes very fair outward movement, sometimes very poor. The right cord has always been the better of the two, and on the last occasion the left appeared to have no movement whatsoever. He says he is enormously improved and that the speaking voice is now normal. No cause, such as aneurysm, etc., was found.

Sir FELIX SEMON said he would ask Mr. Muecke to change the title of this case,¹ because he felt that anyone reading of double abductor paresis caused by vocal overstrain would think a new kind of cause for abductor paralysis had been encountered. Probably all who had inspected this patient had found there was no disease at all, and that the vocal cords moved well outwards, as described in the second part of the notes. His own opinion was, not that abductor paralysis had been caused by the overstrain, but spasm, analogous to writer's cramp, due to overaction on the part of the adductors, and that in consequence of that perverse action the cords could at times not be abducted as well as should be. This was an entirely different thing from abductor paralysis associated with organic disease.

Mr. MUECKE replied that he wrote the notes a month ago, and when the patient came a fortnight later there seemed to be a cure; he thought that was so now, and that any lacking movement was functional.

Tonsils and Cervical Glands removed Post Mortem.—A. R. Tweedie, F.R.C.S.—Male, aged forty-seven. Sections of the growths on both sides suggested an epitheliomatous infection. The specimens were submitted for confirmation of this latter point.

Sir STCLAIR THOMSON asked if both tonsils exhibited epithelioma? He had had an analogous case, the growth being sarcoma, in a girl, aged seventeen. Mistakes were made about it because both tonsils looked so much alike. There were glands on each side, and the tonsils projected. They had been punctured. What attracted his attention was the hardness of the glands. He shelled the tonsils out under an anæsthetic, and they proved to be sarcomatous.

Sir FELIX SEMON did not see why both tonsils should not be epitheliomatous from contact, as was sometimes seen in the case of the lips, or the vocal cords. One side might have been infected from the side originally infected.

Mr. HOPE remarked that two years ago, at St. Mary's Hospital, there was a man suffering from sarcoma cutis, and both his tonsils were found to be sarcomatous, as proved by removal and subsequent sectioning.

Cartilaginous and Fibrous Growth.—A. R. Tweedie, F.R.C.S.—Girl, aged eighteen. The site of origin was apparently the left Eustachian cushion, or the area between the latter and the upper end of the adjacent posterior pillar. It occupied the greater part of the naso-pharynx.

¹ The original title given to this case was "Double abductor paresis."

Mr. WESTMACOTT said that five years ago he recorded a case similar to this. The growth was so large that its removal from behind the soft palate was difficult. The patient was a boy, aged twelve, and there had been no recurrence. It was a pure chondroma. It filled the whole nasopharynx, and was growing forward into the left nasal fossa.

Specimen showing (?) Ulceration of the Left Internal Carotid Artery.—A. R. Tweedie, F.R.C.S.—The patient, a boy, aged one year and eight months, had been ill three weeks before with a "sore throat," from which he had been regarded as convalescent by his doctor for some four days. When first seen by the exhibitor there had been alarming intermittent attacks of hæmorrhage from the left ear for the last thirty-six hours, giving ground for suspicion of some aural lesion. There was no sign, however, of middle otitis or mastoid disease, but the left peritonsillar area was infiltrated and injected, and the parotid and submaxillary lymph-glands were enlarged. An investigation under an anæsthetic was advised and carried out some two hours later when an urgent tracheotomy was required. After the patient had then recovered on opening the mouth the left half of the soft palate was seen to be bulging markedly forward, and a peritonsillar incision here evacuated about an ounce of blood-clot. As there was also a semi-fluctuant swelling behind the sterno-mastoid, an incision was made here too, and the resulting cavity found to communicate with both the peritonsillar and retropharyngeal spaces. The patient's condition did not admit of more than merely packing this wound with gauze, and in spite of all attempts he died about half an hour later.

Post-mortem.—An "ulcer" was found in the internal carotid immediately below the base of the skull, the adjacent lymph-glands were enlarged, but no naked-eye sign of pus could be seen. The bleeding had reached the external auditory meatus *via* a fissure of Santorini. The middle ear was intact and healthy.

Dr. WATSON-WILLIAMS said he was reminded of a case several years ago of a boy who was to have been operated upon for adenoids the following day, but the patient almost suddenly died from copious hæmorrhage. It showed how dreadful a position might arise if one operated for adenoids without being aware of this condition. He believed in that case the trouble was due to a breaking-down tuberculous gland, which seemed to have opened the carotid artery.

Epithelioma of the Larynx in a Man, aged twenty-eight.—Sir StClair Thomson, M.D.—A microscopical section from the case shown by Dr. Noel Bardswell on May 3, 1912.¹ When the patient was shown in May last he was examined by several members, but no one suggested malignant disease. Sir Felix Semon said he did not think that a diagnosis was then possible. An exploratory laryngo-fissure was started, and the cartilage was found to be replaced by a malignant growth. No operation was possible. In the *Proceedings* of the Section for March 1, 1912, p. 93, will be seen the report on an epithelioma of the larynx removed *post-mortem* from a man, aged twenty-three. That I should be able to show two cases of epithelioma of the larynx within three months, in patients aged respectively twenty-three and twenty-eight, gives rise to the suggestion that malignant disease is becoming more common in early life.

¹ JOURN. OF LARYNGOL., RHINOL., AND OTOL., 1912, xxvii, p. 437.

Radical Frontal Sinus Operation (Killian).—Sir StClair Thomson, M.D.—These two cases are shown (1) on account of the severe headache which impelled the patients to seek relief at any risk, (2) to illustrate the very satisfactory cosmetic result, and (3) to show the complete cure of suppuration.

Case 1.—Male, aged thirty. For nearly six years he had a discharge from the left nostril, with severe left frontal headaches. In July radical operation was carried out on his left frontal, ethmoidal, and maxillary sinuses. He is completely relieved of all headache, and with marked restoration in general health.

Case 2.—Female. This patient was also operated on in July. She is a hard-working woman from the country, and begged for relief, although warned of possible risks of the operation. Operation on the right maxillary sinus failed to relieve her, and a complete Killian was therefore carried out on the right frontal sinus. She has been absolutely relieved of all trouble of headache and discharge.

Dr. D. R. PATERSON asked whether Sir StClair Thomson had anything to add as to the method of dealing with the wound in these frontal sinus cases. His own practice recently had been to leave the eyebrow wound open for a week, making a secondary suture a week later. There was perhaps not such a fine linear scar then, but still some months afterwards the scar was hardly noticeable.

Dr. WATSON-WILLIAMS suggested that paraffin injections might be used in such cases. Formerly he had used injections too early, before the tissues over the depression became quite lax. But in one case so treated, in which the patient stayed away for a year before coming again, the effect of the injection was admirable.

Dr. DONELAN, discussing the question of leaving the external wound open, said it was of course possible, even a considerable time afterwards, to do a plastic operation and bring the edges in nearly perfect apposition. With regard to paraffin, from his experience of it in other deformities he thought that, perhaps after a long interval, injections of the variety that could be used cold by means of a syringe, such as that of Alexandre, would be found likely to yield the best results.

Dr. DAN MCKENZIE said the reason for leaving the wound open was that it was dangerous to close it, and Killian was one of those who had pointed that out. The difficulty connected with subsequent suturing could be overcome by inserting the sutures at first, and not tightening them until later.

Mr. HOPE said that in one case in which a depression occurred it was made to disappear by massage alone; and there was now none to be seen.

The PRESIDENT agreed that the external wound should be left open. A few days since he had operated on a large, right frontal sinus, in which he employed Killian's method. He sutured the outer part of the eyebrow, and put one suture above the internal canthus. One would prefer to sew up immediately because of the "bridge" of bone, which, if it became dry from exposure, might become necrosed. The experience of most men showed that to close a frontal sinus wound at the time of operation was risky; he had lost two cases by doing that, and he believed it was the cause of osteo-myelitis of the frontal bone—*e. g.* there was obstruction to free drainage. If infective elements got into the diploë, he did not know any means of saving the patient's life, whereas if the wound were left open one could inspect the parts, and provide free drainage. When using paraffin injections there was often

a chance that something might go wrong. He had not seen many cases in which paraffin injection had been a success; here it would have to be injected deeply. He had spent one and three quarters hours in dissecting paraffin out of a region which had been injected by a "beauty specialist," and from whence it had spread to neighbouring regions, making the lady such a horrible sight that she had not been outside her garden gate for four months. The paraffin used was semi-solid.

Sir STCLAIR THOMSON, in reply, said it was news to him that Killian now kept the frontal sinus wound open in all cases. His own recent cases he closed, as he found as much danger from leaving them open as from closing them. In some of the former cases there had been re-infection of the wound. Moreover, there was anxiety about the bridge. The question of closing the wound depended largely on whether one was certain of having got into all the little galleries, especially the fronto-ethmoidal, behind the bridge; if so, then closing of the wound he regarded as a distinct advantage, not only from the æsthetic standpoint, but because he believed in keeping up pressure: he kept a firm pad above the bridge, and another underneath, and pressed these parts in a direction as if they were to meet. He thought frontal sinus operations were not now done as often as formerly, but that they were now done better; he did not have the same anxiety at the present time which he had in former years in these cases. In unhealthy subjects, in whom the material was fetid, he left a drain at the outer angle, and watched for puffiness. The question of the use of paraffin injections came up periodically at the Section. There was certainly some slight deformity resulting, but not disfigurement; he doubted if paraffin could improve this depression. In a year the deformity would be scarcely visible.

Malignant Disease of Left Sphenoidal Region; Proptosis with Blindness of Eye on same Side; Enlarged Cervical Glands on both Sides.—Hunter Tod, F.R.C.S.—Male, aged fifty-two. A year ago noticed bulging of left eye, and that sight was beginning to fail. Was seen by Mr. Lister, who found there was optic atrophy, and considered the cause might be a growth originating behind the orbital cavity. There was also a considerable headache, and slight nasal obstruction on the same side. Multiple polypi were found within the nose, the middle turbinate was enlarged, and a slight amount of muco-pus could be seen by posterior rhinoscopy in the region of the superior meatus. It was decided to explore the sphenoidal sinus in case this might be the cause of the ocular symptoms, although the proptosis could not be explained by the mere presence of suppuration within the sphenoidal sinus. On removal of the middle turbinate the sphenoidal opening could be seen, and its anterior surface appeared normal. On removal of the anterior wall no pus could be seen, but the interior of the sinus seemed red instead of the normal white appearance. On probing the posterior wall it appeared soft, so much so that malignant disease was suspected, although nothing definite could be discovered. The patient soon left the hospital (April, 1912), but returned two weeks ago. The proptosis is still about the same, but there is complete blindness. A growth can be seen springing from the sphenoidal region, and enlarged glands can be felt on both sides. The case is of interest in that proptosis was the first sign of the growth. The complete absence of headaches and neuralgia may perhaps be accounted for by the relief of tension due to the early removal of the anterior wall of the sphenoidal sinus.

Mr. Tod said that no microscopical sections had been made. There

was no bleeding, except on probing. He would be glad to know whether any treatment could be applied.

The PRESIDENT considered that operative treatment was out of the question in the case, and, unfortunately, radium, even in large doses, was of no use in squamous-celled epithelioma.

Marked Infiltration of Ary-epiglottic Fold and Ventricular Region of Right Side of Larynx, together with Partial Fixation of Vocal Cord.—Hunter Tod, F.R.C.S.—Man, aged thirty. Hoarseness, which was first noticed seven months ago. No pain, and no loss of weight. Chief trouble is attacks of spasmodic coughing, worse at night. ? Diagnosis.

The PRESIDENT thought the right cord was not regular, and the appearance suggested tubercle. He understood that tubercle had been discovered in the lungs since the case first came under notice.

Dr. DUNDAS GRANT said that unilateral limitation when present in tuberculous disease was apt to trip one up in diagnosis, but he had seen several cases of it recently. In one, that of a lady, there was extensive growth confined to one side of the larynx; it was so completely unilateral that it could scarcely be believed that it was tuberculosis; it looked more like gumma or malignant infiltration. The microscope revealed its tuberculous nature. Members might remember a case of erroneous diagnosis which he brought before the Section. His primary diagnosis was tubercle, but this was thought to be contra-indicated by the curious microscopical appearance. It turned out, however, to be tubercle.

Tertiary Syphilis and Ulceration of Larynx, causing Laryngeal Obstruction, treated by Neo-salvarsan.—Hunter Tod, F.R.C.S.—Woman, aged thirty-eight. Three weeks ago hurriedly admitted into the hospital in order to have tracheotomy performed for laryngeal obstruction. Symptoms not being urgent, tracheotomy was not performed, but some relief obtained by giving an injection of morphia, ice to suck, and cold compresses to neck. On examination the whole larynx looked red and congested, the vocal cords appearing as fleshy bands. Extending below the vocal cords, chiefly on the left side, was a large ulcer with a sloughy base. Two days after admission 0.9 grm. of neo-salvarsan was injected into the vein in the arm. This was repeated three days later. Within twenty-four hours after the first injection there was decided relief. The ulceration is healing rapidly, and is now very slight in comparison with what it was. The rapid action of neo-salvarsan is obviously a matter of importance in such cases, especially as a means of avoiding tracheotomy.

The PRESIDENT considered it a very good result, and it was valuable knowledge that tertiary ulcerations might get well so quickly by this method. If one gave iodide of potassium for these cases, one must be prepared for swelling of the soft parts of the larynx, which might need a hurried tracheotomy.

Mr. WAGGETT said, *à propos* the curative effect of salvarsan, that he had a case in which the patient had a syphiloma in the larynx so large that tracheotomy seemed necessary. After one injection of salvarsan it cleared up in a few days.

Dr. FITZGERALD POWELL said that it was generally admitted that in some cases initial improvement took place from the injection of salvarsan, but it was necessary to continue the use of iodide and mercury, or mercury by injections orunction.

Dr. DONELAN said that a large number of cases of syphilis had now been treated with salvarsan at the Italian Hospital. At least two injections were always given. Recurrences were now coming in, some of them as early as six or eight months from the time of the injections. The already large mortality from heart failure, acute arsenical poisoning and other symptoms reported by so many authorities should not be lost sight of when selecting it in preference to mercurial inunction. At the same time there would always be urgent cases like the present in which its rapid, though apparently somewhat temporary action, would prove of the highest value.

Dr. D. R. PATERSON was able to confirm the excellent results from salvarsan in cases of syphilitic laryngeal stenosis. He had seen rapid disappearance after one dose.

Mr. TOD replied that it was the rapid and beneficial action of the neo-salvarsan and the avoidance of the internal administration of iodides which he wished to bring before the notice of the Section.

Faucial Mucous Tubercles: Hunterian Sore on the Back of the Neck.—H. J. Davis, M.B.—Woman, aged twenty-five, with faucial mucous tubercles. The primary Hunterian sore is in the middle of the back of the neck. She attributes this to scratching herself with a comb. The patient is six months pregnant. Husband healthy. Photographs showing primary lesion and large collar of glands exhibited.

Skiagram showing a Butcher's Wire Skewer in the Right Secondary Bronchus of a Girl, aged eight.—H. J. Davis, M.B.—The



Wire skewer in the right secondary bronchus (skiagram by Dr. Morton).

skewer, 2½ in. in length, was exhibited. It had been in the lung seven weeks, and owing to the point being upwards it was very difficult to extract. The child was very ill with broncho-pneumonia (unilateral), but rapidly recovered when the foreign body was removed, and was now perfectly well.

The PRESIDENT said Dr. Davis's patient reminded him of the well-known case reported by Dr. Brinnings, in which a carpet-nail was impacted, head downwards, in the bronchus, and was only removed after

nine attempts at extraction. Dr. Brünings invented and described a special instrument for dealing with this class of foreign body.

Dr. D. R. PATERSON called attention to a simple method of masking the point of a pin directed upwards. When he had to remove a safety-pin which was open and had the point directed upwards, he passed a fine metallic tube over the point, and with that in position he caught hold of the safety-pin by the other limb and removed it.

Enlarged Tonsils. ? Lympho-sarcoma or Lymphadenoma.—**H. J. Davis, M.B.**—Woman, aged thirty-eight, with large ragged tonsils. There is a large indurated mass of glands in the side of the neck. She states these have been there for four years. The case is either one of lympho-sarcoma or lymphadenoma.

Dr. DAVIS said he had had a further report that the Wassermann reaction was positive. But the case did not look to him like one of syphilis. There was a tumour behind the palate, but he did not know what was the cause of the enlargement of the glands.

Dr. DUNDAS GRANT said it seemed to him that the tonsil on the right side was not so much enlarged as pushed inwards by the glandular mass; he thought this might be a condition altogether independent of that of the tonsil.

Dr. DAVIS replied that the tonsils had now cleared up very much, but they had been white with secretion. Since Mr. Tyrrell Gray advised him to give iodide of potassium and mercury they had cleared up.

Skiagram showing a Penny Coin impacted in the Œsophagus of a Woman, aged twenty-five.—**H. J. Davis, M.B.**—The coin was exhibited, with two grape-skins, which were removed by œsophagoscopy, and were lying over the foreign body, obscuring its view. The patient had been unable to swallow anything for four days. The coin was firmly held by the œsophagus, and it was not easy to remove as the jaws of the forceps kept slipping off.

The PRESIDENT said he had experienced how easily the coin might slip from smooth-edge forceps, and he thought the best way to remove such a body was with the old-fashioned coin-catcher, though it should be used under the guidance of the direct method.

Dr. IRWIN MOORE pointed out that the difficulty which Dr. Davis had experienced in this case in grasping and holding the coin with Brünings' forceps could be obviated by the use of the strong œsophageal forceps which he (Dr. Moore) had designed and introduced for removing foreign bodies with Brünings' tubes. With these forceps one could get such a firm grip of any foreign body, whatever its shape, that, once seized, it was next to impossible to lose hold of it.

Sluder's Guillotine.—**H. J. Davis, M.B.**—This pair of tonsil guillotines, were by Dr. Sluder, of St. Louis, U.S.A. The instrument is well known, and is designed for enucleating tonsils, however large, or however small, whether buried or not. The method has been already described. The blades must be blunt, and as the tissue external to the capsule is difficult to cut through, Dr. Sluder has invented a "mechanics dog," which enables the blunt blade to crush through any resistance; by the aid of the "dog" a piece of silk or wool can be easily severed. It is made by Müller, of Chicago. I have used it several times, and it answers the purpose which the inventor claims admirably.

Dr. WATSON WILLIAMS promised to show at a subsequent meeting a

tonsillectomy instrument which he had devised some time ago, and which utilised the grasp of the hand instead of the weaker thumb—a principle that had been utilised by others. For tonsillotomy he had seen no instrument more ingeniously constructed than that now shown by Dr. Donelan.

Pansinusitis.—**P. Watson-Williams, M.D.**—This was a case of pansinusitis, in which the double frontal sinus suppuration has been practically cured by intra-nasal operations, particularly removal of fronto-ethmoidal cells, followed by lavage, together with double intra-nasal radical antral operations, and partial removal of ethmoidal cells and opening up of sphenoidal sinuses. The patient was a solicitor, aged fifty-four, who, in 1907, had become very depressed, and carried on his profession with very grave difficulty. He had suffered from a red, swollen, purplish nose since boyhood, and the doughy, pitted, purple-veined nose was a distinct disfigurement. Sinusitis probably determined originally by a septal deflection, but when the patient was first seen it had extended to all the accessory sinuses. He had now completely lost his depression and aprosexia. He was shown now, four years after the last operation was performed, to illustrate the advantages of *not* operating by radical external methods in cases where intra-nasal operation relieved symptoms and gave good drainage.

The PRESIDENT said it was an illustration of the present-day practice of thoroughly draining the suppurating lower sinuses and curing the upper sinuses by irrigation and free drainage. This man was at work, and full of intelligence and alertness, whereas mental concentration was impossible before the suppuration in the sinuses had been cured.

Dr. WATSON-WILLIAMS replied that he wanted to emphasise by it his belief as to the possibility of getting extensive frontal sinus suppuration, if not cured, at any rate ameliorated in a large proportion of the cases without any external operation, which latter he only performed when driven to it.

Infiltration of Uvula, Epiglottis, and Arytænoids.—**C. W. M. Hope, F.R.C.S.**—F. M.—, married, aged thirty, four children. Resident in Norway seven years. For the last twelve months noticed some hoarseness, also a gradual thickening of lips. Has had two seizures; one before and one after third pregnancy. Examination shows solid, white swelling of uvula, spreading on to soft palate; same condition of left arytænoid, epiglottis, both ary-epiglottic folds, and slightly also of the right arytænoid. Cords are free. Palate is *not* anæsthetic. *Addendum.*—Since showing the case the Wassermann reaction has been done: it is positive; and 0.6 grm. of salvarsan has been given. A second dose will be given next week.

Dr. DUNDAS GRANT said the case presented some features suggestive of myxoedema. The patient said her face had now become fatter than before. The thyroid gland was scarcely perceptible. There was no ulceration, and it would be interesting to know if any further signs of hypothyroidism were present. In any case it might be tried whether treatment by thyroid extract might be effective.

Mr. E. D. DAVIS said that two or three years ago he saw a case with much the same appearance at the Bergen Lazarette; and in that case as well as in this the pharynx was anæsthetic. There was some œdema of the epiglottis and the arytæno-epiglottidean fold, but the nose was normal.

The patient bailed from Christiania; he thought that further investigation might prove it to be a case of leprosy.

Mr. HOPE replied that he also had thought of leprosy, but the case had not yet been fully gone into.

Case of Atrophic Rhinitis, showing several unusual Features.
—Cyril Horsford, F.R.C.S.—Patient, female, aged twenty-one. Well-marked atrophic rhinitis on both sides, with enlarged middle turbinals which have fused together anteriorly through a large perforation in the cartilagous portion of the septum. Trouble with nose dates from childhood. Both antra dark on transillumination, but when washed out are found to be empty. Some evidence of congenital syphilis observed in rhagades on upper lip. Complete occlusion of right auditory meatus with formation of adventitious drum. Early stage of similar condition in left ear—namely, chronic suppurative otitis media and narrowing of left auditory meatus.

The PRESIDENT said that perforation in itself did not suggest syphilis; it might be caused by trophic changes, such as one frequently saw in the so-called "idiopathic" perforations.

PROCEEDINGS OF THE PARISIAN SOCIETY OF LARYNGOLOGY, OTOTOLOGY, AND RHINOLOGY.

February 10, 1911.

Partial Radical Mastoid Operation, with Preservation of the Tympanic Membrane (Method of Botey [Barcelona]).—Luc.—M. Luc showed a patient who in June last had undergone antrotomy and almost complete resection of the mastoid process for suppurative antritis complicated by diffuse osseous lesions. Persistence of suppuration at the upper part of the osseous opening led Luc to diagnose an osteitis of the outer wall of the aditus. At this period (commencement of September) the tympanum no longer suppurated, but a perforation of the membrane of average size remained. Luc then decided to perform a partial radical operation, resecting the osseous wall in question (which was, in fact, in a condition of osteitis), but stopping exactly at the limit of the tympanic membrane. Nevertheless, the incus was involuntarily extracted, which, without doubt, explains the partially satisfactory result of the intervention from the point of view of audition. After considerably enlarging the fibro-cartilaginous meatus according to Siebenmann's technique, the retro-auricular wound was closed with a view to healing by first intention. During post-operative treatment, closure of the perforation in the membrane was obtained by the application of trichloroacetic acid. Complete cicatrization occurred at the end of three months. Perfect healing resulted.

Large Choanal Polyp in a Child eleven years of age.—A. Grossard.—The author showed a tumour (myxoma) the size of a

large hen's egg, removed by the pharyngeal route with an ordinary snare. This polyp, prolongations of which were observed in the left nasal fossa, bulged forward the palate. It extended several centimetres below the uvula, almost filling the cavum. With the palate raised one could isolate the mass, but firmly gripped by the pharyngeal walls it remained immobile. This peculiarity enabled one to adjust the wire of the snare sufficiently high up to get a good grip of the growth, and to tear it away with its pedicle. The interest of the case lay in the size of the polypus, which weighed 32 grm., in the ease of its removal owing to the slight resistance of its long and thin pedicle, and lastly, in the absence of hæmorrhage following the removal of so large a tumour, which had given rise to frequent and copious bleeding for about two years. There was no post-operative reaction, and the child was able to return home immediately.

Protective Plate for Clar's Mirror.—Consteau.—The author showed a protective plate made in aluminium, which shields the surgeon from possible contagious ejections.

Tracheotomy and Thyrotomy.—F. Furet.—The author exhibited a man, aged thirty-two, who presented himself at the clinic for the first time on December 14, 1910, in a condition of suffocation and imminent death. He fell down unconscious when he was being conveyed to the operating theatre for tracheotomy by Furet. For the past year this patient had increasing difficulty in breathing, and coughed and expectorated freely. When it was possible to examine him, a large, smooth, whitish-grey tumour was observed in the larynx, which one did not succeed in removing intra-laryngeally. On January 5 last Furet performed thyrotomy under local anæsthesia (novocaine), which enabled him to recognise and easily remove a large fibro-myxoma, probably originating in the left ventricle. The after-results were uncomplicated, in spite of a violent fit of coughing on the fourth night after the operation, lasting two hours, and causing rupture of the sutures of the skin and cartilage. To-day the wound is closed, the patient breathes normally, and his general health is excellent.

M. LUBET-BARBON pointed out the excellent result which he obtained from the application of Unna's paste for wounds in process of cicatrisation. It is a supple medicament, easy to apply and remove.

ROUVILLOIS said that apart from the usual procedures for inducing laryngeal anæsthesia (swabbing the surface, subcutaneous and submucous injections), there was reason for reserving a place for another method—regional anæsthesia by cocainisation of the superior laryngeal nerve. Quite recently M. Sieur and he had had occasion to adopt this method in the case of a tuberculous patient suffering from ulcerative laryngitis, rendering deglutition almost impossible. Three injections of cocaine, 1 in 200, introduced over the trunk of the superior laryngeal nerve were sufficient to considerably lessen the pain induced by deglutition and to allow of feeding. This method could be employed with advantage in all surgical interventions by the intra- or extra-laryngeal route (removal of polypi, laryngo-fissure, laryngostomy, etc.). Details concerning the technique could be obtained in the excellent articles by Chevrier and Cauzard (*Bulletin Médical*, February, 1910) and Boulay (*Presse Médicale*, January 28, 1911).¹

Robert Foy.

H. Clayton Fox.

¹ See also Broeckhaert, JOURN. OF LARYNGOL., RHINOL., AND OTOL., vol. xxvii, p. 524.

April 8, 1911.

President : M. GEORGES LAURENS.

Treatment of Dysphagia in Tubercular Laryngitis by Alcoholisation of the Superior Laryngeal Nerve.—**M. Munch.**—A patient was shown suffering from tubercular laryngitis, who had suffered from considerable dysphagia, preventing all alimentation. Deep injections of alcohol at the seat of election of both nerves had completely banished the dysphagia. The patient now fed well and his general condition was obviously improved.

Luc showed—(1) A patient operated on on May 22, 1909, for **epithelioma of the right vocal cord** (histological examination) by laryngofissure. No relapse, only hoarseness (2) A patient operated on October 23, 1909 for **epithelioma** (likewise verified histologically) **of the right fronto-ethmoidal region**, by Moure's operation (there was pus in the frontal sinus). Recovery maintained.

Dressing Radical Mastoid Cases with Boro-Chloretone powder.—**C. J. Koenig.**—All are aware of the intense pain produced by the insufflation of boric acid into the operated cavity during the early days before the osseous surfaces are covered with granulations. The author tried boro-chloretone (Parke, Davis's), which contains about one part of chloretone to four parts of boric acid, and found it not only unattended by smarting or pain, but it actually possesses an anæsthetic effect. The makers state the powder to be non-toxic. Even when employed with a free hand he had never observed any toxic phenomena. After some dressings pure boric acid may be substituted.

Closed Frontal Sinusitis operated on during Coma.—**Guisez.**—Affected with right frontal sinusitis, closed, without nasal suppuration, the patient had visited the clinic the evening before, suffering terribly in the forehead. Guisez advised external operation, or at the very least, endo-nasal drainage by removal of the middle turbinated body. The patient refused. The following day she became comatose, with an elevated temperature. Operation, performed as a matter of urgency, revealed right frontal sinusitis, absolutely closed. Both tables of the frontal bone were intact. No cerebral complication. Consciousness gradually returned after the operation and recovery followed without any untoward events.

Exhibition of Two Foreign Bodies Extracted by Œsophagoscopy.—**Guisez.**—One was a tooth-plate situated at the upper third of the Œsophagus, and the other a prune-stone from the left bronchus of a child aged ten.

Stenosis of the Lower Portion of the Trachea from Disease of the Tracheo-bronchitic Glands.—**Guisez.**—It concerned a child who a year ago was suddenly seized with intense dyspnoea. Examination of the larynx showed no obstruction. Tracheoscopy revealed compression of the posterior tracheal wall, enabled a diagnosis to be made, suggested the situation for tracheotomy, allowed the introduction of a long tube beyond the stenosed point, and finally brought about a recovery. This is the third case which the author has been able to diagnose and treat under similar conditions.

Laryngostomy for Laryngeal Stenosis, the Result of Laryngotyphoid Complications.—**Sieur.**—During convalescence from typhoid fever laryngeal lesions developed, and laryngotomy had to be performed as a matter of urgency. It afterwards became impossible to remove the cannula owing to stenosis of the subglottic region. Attempts at dilation by means of metal dilators introduced through the mouth and Killian's T-shaped tube passed through the tracheal opening having failed, it was decided to resort to laryngostomy. This was performed under local anæsthesia (cocaine), and in two months the normal calibre of the larynx was obtained by the employment of Killian's tubes in increasing sizes. When dilatation seemed complete the use of dilators was gradually curtailed, and three weeks after the cessation of treatment the laryngo-tracheal opening closed spontaneously. This is a point particularly interesting to note, seeing that this closure is not always easy to attain surgically.

G. Veillard.

H. Clayton Fox.

Abstracts.

LARYNX.

Nemai, J. (Budapest).—**Studies in the Comparative Anatomy of the Larynx of Mammals.** "Archiv für Laryngol." vol. xxvi, Part III.

This paper is merely a preliminary one, the research, which was begun some years ago, being still in progress. After some reference to previous workers in the same field, a section is devoted to the differences between the aditus laryngis of man and that of most other mammals. In the case of the latter the ary-epiglottic folds are almost non-existent, the folds of mucous membrane which pass backwards from the margins of the epiglottis ending in the lateral walls of the hypo-pharynx, or, at most, curving round and reaching only the lower part of the arytenoids from behind. The arytenoids and cartilages of Santorini are thus in no way embedded in the folds and their upper borders stand quite free.

There follows a fairly detailed description of the larynx in a number of ruminants, and also in the pig, both domestic and wild, and in the horse. In most of these animals the entrance of the larynx lies really in the naso-pharyngeal space, being, under ordinary circumstances, shut off from the cavity of the mouth by the soft palate, which reaches almost to the base of the tongue in the glosso-epiglottic fossa, and is applied to the anterior surface of the epiglottis. Through the passage left on either side in the region of the pyriform sinus, finely divided food can pass from the mouth down into the lower pharynx. By this arrangement, therefore, the animal is enabled to swallow and breathe at the same time. Even the carnivora adopt this method in swallowing fluids, although their solid food, being swallowed in large masses, passes over the laryngeal entrance, as does all food in man. The larynx is in a measure fixed in this position by a muscular ring or isthmus formed of the palato-pharyngeal muscles. This ring exerts considerable lateral pressure on the laryngeal entrance, and it is probably the necessity for resisting this pressure that accounts for the large and wide cartilaginous processes which are attached to the oral ends of the arytenoids in many mammals. These processes consist in most of the animals examined of hyaline cartilage, and are directly continuous with the arytenoids themselves.

The author, however, adduces evidence to prove that they are represented in man in a vestigial form by the cartilages of Santorini, for the latter, although composed of elastic cartilage, and not continuous with the arytenoids, are nevertheless enveloped by the same perichondrial layer.

In reference to the muscles of the larynx it is interesting to note that the crico-arytenoideus posticus, in regard both to its form and the direction of its fibres, is practically identical in all the placentalia, including man—a fact in harmony with the importance of its function. Some of the other muscles show more or less considerable variations in both structure and function. The inter-arytenoideus, for example, among the ungulates, while it acts in association with the ary-epiglotticus and thyreo-arytenoideus as a constrictor of the aditus laryngis, must be regarded also as serving, at times, as a dilator, for its attachment is such that contraction of the muscle tends to increase an abduction of the cords already established by the posticus muscle.

It is known that in adduction and abduction of the cords the arytenoids execute a rocking movement in addition to that of mere rotation, the result of which is that during adduction the long axes of the arytenoids move forward and inward while the vocal processes move downward, the reverse occurring during abduction. The author finds that this see-saw or rocking movement of the arytenoids is a constant feature of the mammalian larynx, and that in many members of the order the anatomical conditions are such as to make simple rotation impossible.

The author concludes with a statement of his conviction that similar studies of the larynx of the lower animals will throw much light upon the function of the organ in man.

Thomas Guthrie.

NOSE.

Seibert, E. C.—The Superior Maxilla: A Discussion of its Proper Development. "Annals of Otol., Rhinol., and Laryngol.," vol. xxi, p. 145.

The author concludes that normal nasal respiration is only attained through proper lateral development of the maxillæ, *i. e.* the palatal processes, and that this development is materially retarded by those factors which prevent nasal respiration. In this abnormal development the shape of these bones may be materially altered, thus affecting their relations to contiguous structures, and in this changed relation and altered shape we have factors for changing the direction and the lumen of the nerve-canal traversing these bones, thereby making pressure upon their contents and causing alteration of function, or, from irritability, reflex phenomena. He considers no child is too young from whom to remove causes for restricted nasal respiration, and when abnormal development has occurred, readjustment of the maxillæ probably offers the best results that can be looked for.

Macleod Yearsley.

Hurry, Jamieson B.—Vicious Circles associated with Disorders of the Nose, Throat, and Ear. "Lancet," May 11, 1912, p. 1264.

The author, well known for his interesting work on "Vicious Circles in Disease," has turned his attention to our specialty. Diseases of the nose are frequently complicated by the operation of a circle, the genesis of which depends largely on stenosis or an abnormal patency. Such vicious circles are described resulting from deflected septum, mouth-breathing, etc. Reciprocal relations are frequently established in con-

nection with sinusitis. Under the head of "Throat," are instanced laryngeal obstruction, abductor paralysis, tuberculosis, laryngitis, and various neuroses. Several instances are also given in regard to the ears. The paper really requires to be read *in extenso*. *Macleod Yearsley.*

Lothrop, Oliver A.—**Suturing as a Substitute for Splints after the Submucous Resection of the Nasal Septum.** "Boston Med. and Surg. Journ.," clxvi, p. 483.

The author suggests the introduction, by means of special instruments, of numerous sutures of silk or catgut (nine are shown in the diagram) through the flaps. A wire loop is used temporarily to keep the flaps together during the passage of the sutures, the ends of which are tied round the columella. The stitches are withdrawn after two days.

Macleod Yearsley.

Pulleine, Robert.—**Solid Paraffin in the Treatment of Ozæna.** "Australasian Medical Gazette," September 14, 1912.

Under the heading of "Ozæna" a description is given of atrophic rhinitis. Under the heading of "Treatment," the author says if we can narrow the abnormally wide nose enough to make the expiratory effort capable of clearing the nose we arrive at a stage of comparative health. Injections of paraffin under the mucosa of the septum and above the inferior turbinal he found a failure on account of the atrophic condition of the membrane. The method which he has found very valuable is the implantation *en masse* of a piece of solid paraffin. As in the septum resection, the muco-perichondrium, and further back the muco-periosteum, is elevated, and a piece of paraffin, cast in a rubber tube, is trimmed down and inserted, and the wound closed. This makes an elevated ridge along nearly the whole length of the septum and narrows the nose so that an efficient expiratory effort can be obtained. The technique is important. (1) The implanted mass must not be large enough to cause undue tension. (2) The incision must be in the skin and not in the mucous membrane or in the muco-cutaneous margin. (3) The anterior end of the implanted mass must not come up to the wound in such a way as to cause tension in the sutures. (4) Wound must be accurately closed. (5) If in lifting the structures a perforation occurs, it is useless to go on, as the implanted mass will be thrown off. *A. J. Brady.*

EAR.

Holmes, E. M.—**Examination and Treatment of the Eustachian Tube by the Aid of the Naso-pharyngoscope.** "Annals of Otol., Rhinol., and Laryngol.," vol. xx, p. 511.

This is the author's second paper and concerns 900 cases, 400 of which have been classified. He points out that over 90 per cent. of all the diseases of the middle ear are due to disease primarily in and about the Eustachian tube. Holmes briefly describes the conditions found and their treatment. Acute inflammatory swelling is frequently reduced by cocaine and adrenalin, chronic cases being much less affected by those drugs. Adhesions in Rosenmüller's fossa are common and often productive of tinnitus, and adenoid tissue in the adult is much more frequently extensive in amount and a source of trouble than is indicated by the posterior nasal mirror. Posterior end hypertrophy was found in fifty-four cases. A table of thirty-one cases of acute middle-ear inflammation is given, together with coloured plates of forty-eight different conditions in and about the tubes.

Holmes is convinced that much will be accomplished in the future that we have been unable to do in the past.

Nucleal Yearning.

Pope.—Remarks on "Lombard's Symptom" in Cases of Unilateral Deafness. "*Zeitschr. f. Ohrenheilk.*," vol. lxiv, Pt. IV.

Lombard has pointed out that if, while a person with normal hearing-power is reading in a voice of medium loudness, a Bárány's "noise-apparatus" be suddenly introduced into either ear, immediately the loudness and pitch of the voice is raised, because the reader no longer hears his own voice, and so loses control over its intensity. If the "noise-apparatus" be stopped, at once the voice regains its previous pitch and loudness. In cases of one-sided deafness Lombard asserted that this phenomenon occurred when the noise-apparatus was inserted in the sound ear, but not when the deaf ear was tried.

Pope, in a series of tests, found that in twenty-seven people with normal hearing, in twenty-four the voice became louder, in three no change in the voice occurred; in eight cases of one-sided deafness, six louder, two no change. In six cases of unilateral complete deafness, two showed an increase in the loudness of the voice, two showed no change, and two became disturbed and stopped reading.

The discrepancies are probably to be explained from the fact that the loudness of the voice is also controlled by the muscles of expiration, and that in various people the co-relationship of the hearing and phonating centres differ in degree.

As a method of testing simulated deafness it is unfortunately not of much value, owing to the fact that a person soon learns to control his voice in spite of the noise-apparatus, and so no change in loudness occurs. As in many other tests, a positive (*i. e.* a raised pitch or loudness of voice) result is of value, a negative almost useless.

Lindley Sewell.

Ballance, C. A.—Epithelial Grafting as a Means of Effecting the Sure and Rapid Healing of the Cavity left by the Complete Mastoid Operation. "*Lancet*," August 17, 1912, p. 428.

This paper was read before the International Otological Congress recently held in Boston. The author contends that grafting gives (1) rapid healing of the entire wound on ordinary surgical principles; (2) immediate protection of the raw bone surface by a layer of living epithelium, reduction of pain, discomfort, and liability to reinfection of the bone; (3) considerable shortening of the time of skilled attendance; (4) improvement in hearing. He considers Jansen's fear that grafting produces loss of hearing to be unfounded. These advantages are only to be obtained by a single graft, cut sufficiently thin and accurately applied. As alternatives to grafting he discusses blood-clot dressing, bismuth paste, scarlet-red, and Baracz's method of using a graft of skin taken from the neck. He objects to the blood-clot method because, in the complete operation, the object is not to fill the cavity with a mass of cicatricial tissue, but to epithelialise the cavity as rapidly as possible. Bismuth paste he has found useful as a substitute for, and as an adjunct to, grafting. Scarlet-red does not give any great advantage. In labyrinthine surgery, he thinks, grafting will be found useful, and he suggests the possibility, in cases with complete tympanic deafness, of grafting, after making an artificial opening in the capsule of the cochlea. After entering into the history of the grafting operation, he considers the question of when the grafting should be done. In a few selected cases

it may be applied immediately with advantage, but it is usually better to postpone. The technique of grafting is described in detail.

Macleod Yearsley.

Frey, Hugo.—Concerning the Occurrence of Diseases of the Inner Ear in the Early Stages of Syphilis: A Contribution to the Question of the Effects of Salvarsan. "Wien. klin. Wochens.," Bd. xxiv, Nr. 11.

Those who hold that salvarsan may directly injure the cochlear or vestibular nerve are influenced in this supposition by the fact that in the pre-salvarsan period very few cases were recorded in which these nerves were affected in the early stages of syphilis. Frey has, however, succeeded in collecting over sixty well-authenticated cases in which the cochlear or vestibular nerve, or both, were markedly affected in the early secondary stage of syphilis, and in the majority of which the internal ear symptoms partly or entirely subsided under specific treatment. The explanation why a far greater number of such cases have not been recorded is to be sought for in the fact that systematic and thorough examinations of the inner ear and an exact differential diagnosis between diseases of the middle and inner ear have only been possible within recent years, and that the number of medical men sufficiently educated in otology to appreciate and record such cases was until recently a very small one. It may further be taken for granted that the number of these cases recorded is certainly very much smaller than the number which has been observed, and still smaller than the number which has actually occurred. Finally, there is no doubt that slight grades of deafness, especially if unilateral, are often overlooked by syphilitics, whose interest is primarily centred in the disease itself. The author is of opinion that this question cannot be definitely settled until syphilitics are systematically examined for lesions of the internal ear, and he effectually disposes of the idea that such lesions were "almost unknown" in the pre-salvarsan period.

J. B. Horgan.

MISCELLANEOUS.

Freedman, Louis M.—Two New Instruments for Nose and Throat. "Boston Med. and Surg. Journ.," June 20, 1912, vol. clxvi, No. 25.

The first is a splint, for use after submucous resection, composed of two flat plates of ivory connected by a metal spring. The plates of ivory are placed on either side of the septum. The spring is made so light that only the lightest pressure is caused. It is claimed that the use of the instrument results in the following advantages: Absence of congestion and headache. Absence of bleeding after removal on following morning. Duration of healing is shortened. The second instrument is a curved tonsil knife combined with a separator. *Knowles Renshaw.*

Guthrie, Thomas.—Twelve Cases of Foreign Body in the Larynx and Œsophagus. "Liverpool Medico-Chirurgical Journal," July, 1912.

In the first case a long needle, the point of which had become embedded in the left ary-epiglottic fold of an adult male, was removed without difficulty by the indirect method. In the second case a pin had been embedded for two days in the posterior pharyngeal wall of a girl,

aged eleven. Its shaft projected downwards and forwards into the larynx with its head below the glottis.

Attempts at removal by the indirect method only drove it deeper into the pharyngeal wall, but it was easily removed with the Killian tube-spatula and Paterson's forceps. A flat piece of bone, measuring about one inch by three quarters, was removed from the glottis of another patient by the indirect method. Although it had been impacted for three weeks, the fact that it was lying in the glottis parallel to the cords had prevented its giving rise to dyspnoea. In two cases in which a tooth-plate bearing one tooth and no hooks had been impacted in the œsophagus at the level of the upper border of the sternum, removal was effected without difficulty with the œsophagoscope. In two other cases it was found impossible to remove a tooth-plate through the œsophagoscope owing to impaction, and so œsophagotomy had to be performed. A bolus of meat which had become impacted in the œsophagus of a man of sixty-five at eight inches from the teeth was removed with the œsophagoscope, and the absence of any organic stricture established. In two of three cases of a halfpenny in the œsophagus removal was effected without difficulty with the œsophagoscope, but in the third case, in which a previous unsuccessful attempt at removal with the coin-catcher had been made, the coin was found to have been forced upwards under the mucous membrane, and to be buried at about the level of the cricoid. Removal was only performed by the direct method, by tearing through the mucous membrane, but recovery was uneventful. The author concludes that, for the removal of foreign bodies from the larynx in adults, the indirect method is usually to be preferred, while in young children, or when firmly impacted, the direct method under general anæsthesia should be used.

A. J. Wright.

REVIEWS.

Notions Pratiques d'Électricité (The Practice of Electricity for the use of Medical Men, with special relation to Oto-Rhino-Laryngology).

Par MARCEL LERMOYEZ. Avec 426 figures dans le texte. Paris : Masson et Cie., Editeurs, 1913. Prix 20 francs.

This handsome volume of 850 pages might well be called "Electricitas ad usum oto-laryngologicum." It staggers one to see the size to which has grown the little "handbook of electricity" of our youth. Yet we know Dr. Lermoyez too intimately, and his delightful literary skill too well, to imagine that there is in this work a word too much or a line too long. The work is arranged with the logical co-ordination so characteristic of the French mind. The divisions and subdivisions, the head-lines and cross-references, the drawings and diagrams, the foot-notes, the literary references, even the biographical notes, all add to the pleasure of reading a book which has almost persuaded me to once and for all understand electricity and make myself independent of electricians!

Does anyone want to know what a "kilowatt" is, or how much work a walking donkey can do in a second, or what Lucretius thought of electricity, or where Marconi was born? All these can be found in the book of Lermoyez, set forth with as much clarity and charm as are the practical methods for charging and keeping accumulators, applying

the galvano-cautery, managing electro-motors, carrying out electrolysis, understanding Faradism, taking care of portable light accumulators, and sterilising one's instruments or heating one's study by electricity.

Not the least striking factor about this book—with its one picture to every two pages—is Lermoyez's acquaintance, not only with English science, but with English scientists. Here we can read in language clearer than that of its native country an explanation of “la théorie de la self-induction.” We can find out what are the scientific discoveries of Sir William Ramsay, learn that James Watt was born in Greenock, and realise that “nul mieux que lui ne symbolise le génie anglais, caractérisé par une ingéniosité extrême dans l'invention et par un sens pratique incomparable dans l'exécution.” The only pity in this sentence is, that Lermoyez should characterise as English the genius that was Scottish! Not that our *confrères* cosmopolitanism is limited to the British Isles. He is at home on both sides of the Rhine, and this remarkable book even offers to explain why the ancient Greeks made so little progress in practical science!

In the language of the street, “electricity has come to stay,” and possibly in no department of medicine will it be more regularly employed than in oto-laryngology.

I would advise all young specialists to make themselves acquainted with it on a good foundation of understanding, and both in theory and practice they will find no work more useful, and certainly none more attractive, than that of Dr. Lermoyez.

StClair Thomson.

Traité de Laryngoscopie et de Laryngologie Opératoire et Clinique. Par Dr. Th. HERYNG. Paris: Masson et Cie., 1912. Un volume in — 8, de xvi + 524 pages, avec 155 figures dans le texte. Prix 14 fr.

This volume on laryngoscopy and laryngology is not the usual “confection” of a text-book as generally understood. It begins with a clear description of the surgical anatomy of the larynx. The first part is devoted to examination of the larynx and lower air-passages. The second part deals largely with methods of treatment and inhalations, gargles, insufflations, electricity, etc. The third part embraces local anæsthesia, asepsis, post-operative treatment, and then branches off into various voice troubles and the treatment of tuberculosis of the larynx. The fourth and last part studies the laryngeal developments of general and infectious disorders.

It is therefore seen that this is not the orthodox book for the student, nor yet the handy volume of reference for the practitioner. The man who will enjoy it is the specialist, who will here find himself in close contact with the personal touch of a vigorous mind, one who impresses himself on his work, his patients and his colleagues.

Dr. Theodore Heryng in his clinic in Warsaw has had the courage to look and think for himself. Although he is well known at all our congresses, and his gift of tongues makes him acquainted with the literature of Europe, still he has not cumbered his treatise with any bibliographical references. As is well known, his original work has been chiefly identified with the surgical treatment of laryngeal tuberculosis, improvements in inhalations, the evolution of transillumination, and the local manifestations of syphilis and other general infections.

But he writes of nothing that he has not made his own, and here readers will enjoy the radiance of a direct source of light and not of a mere reflection.

StClair Thomson.

Forschungen und Erfahrungen, 1880-1910: Eine Sammlung ausgewählter Arbeiten. Von Prof. Dr. Sir FELIX SEMON, K.C.V.O., Fellow of the Royal College of Physicians, etc. Zwei Bände. Mit 2 Tafeln und zahlreichen Textfiguren. Berlin: August Hirschwald, 1912.

Every laryngologist, every medical man for that matter, is acquainted with the scientific work and achievement of Sir Felix Semon, but for the most part only at second hand. For until the appearance of these volumes containing his collected works, the original articles, hidden away in remote, dignified archives, had been neither read nor conned by those of the younger school, although they are, of course, still fresh in the memory of the seniors.

In one of his *obiter dicta* Semon very properly counsels the aspirant to medical honours to publish his doings in reputable and widely read journals. Nevertheless, even the most important article in the most popular magazine sooner or later comes to its resting-place under a pall of dust, although the truths it has disclosed may live on eternally in the well-thumbed pages of our text-books.

With many, indeed with most scientific writings, this is no more than they deserve. The grain secure, the husk can be thrown aside and the reaper forgotten. But it is no empty flattery to say that had this been the fate of Semon's writings, not only would our convenience in the matter of ready reference have suffered, but the genuine literature of medicine itself would have been the poorer.

We have here the historical series of investigations which culminated in the discovery of the "laws" of the innervation of the larynx, together with the pioneer work on the diagnosis and treatment of laryngeal new-growths—work of an amplitude and precision surpassed by few, if any, of the greatest labourers in medicine. To add to these the articles on Cachexia Strumipriva, on the pathological identity of the variously named Acute Laryngeal Œdema, Œdematous Laryngitis, etc., and on Pneumococcus Infection of the Throat is to show in a paragraph the extraordinary debt that laryngology owes to Semon. *Si monumentum requiris, circumspice.*

In addition to articles of more purely scientific interest the author has included in the collection many of the critiques, addresses and biographical sketches which have, from time to time, emanated from his pen. Of these the reviewer has no hesitation in awarding the palm to the last-named. Semon's word-portraits of departed worthies like Virchow and Morell Mackenzie are valuable additions to the history of nineteenth century medicine.

But there is something else in these books: something which imparts to them a quality rarely met with in scientific papers. It is that Semon's work is illumined through and through with the fire of his personality. We do not mean to say that his writing is unduly subjective or that he is less dominated by actuality than a scientist ought to be, for the contrary is the case. Semon becomes possessed of a fact as of a demon, to whose service he devotes all his gifts and the whole force of his being. In other words, his sense of the significance of things is unusually keen. In some respects, indeed, some might think it too keen, and might ascribe to such a hypersensitive strain the preservation, for example, of the article upon the squabble which darkened the death-bed of the Kaiser Frederick III. We admit quite readily that the inclusion of this article can be defended. Nevertheless we believe that a writer of duller sensibility would have omitted it.

It may be objected that reference to the personality of an author is out of place in a scientific review. The answer is that this personality pervades these writings so abundantly that there is no escape from it. The spirit of the author starts from every page. We find, for example, that several of the more important of Semon's researches were actually begun under the stimulus of controversy. But very early in the history of the investigation the opponent in the flesh seems to vanish away, and we behold Semon tackling Nature herself, and from her wresting the victory.

To look upon this book, then, as if it were a collection of mere scientific investigations and addresses, a plain-song in Baconian tones so to speak, would be to ignore its most prominent and fascinating qualities. Moreover, the value of these articles in scientific currency has long since been fixed, and nothing that we could say, whether of praise or of blame, would either enhance or depreciate their position by one stiver.

We conclude by expressing the hope that Sir Felix Semon will confer upon the English-speaking world the same privilege he has extended to the German, and publish at an early date a replica of these handsome volumes in the language of the land of his adoption.

Dan McKenzie.

CORRESPONDENCE.

OSTEOMYELITIS OF THE FRONTAL BONE.

To the Editor of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

DEAR SIR,—I have read with great interest Dr. Dan McKenzie's articles on "Osteomyelitis of the Frontal Bone," and feel greatly indebted to him for his lucid and full analysis of a subject of great interest to all rhinologists. I have drawn his attention, in a private communication, to a slight omission in his summary of published cases, and, as he considers the case I referred to of importance in its bearing on the subject, I send you herewith a short abstract of the notes. This case was reported to the Laryngological Section of the Royal Society of Medicine at a meeting on December 1, 1911,¹ together with three other cases of accessory sinus suppuration, probably set up by entry of water into the nose during bathing. It is, therefore, indexed in the journals under the heading "Accessory Sinuses," and it is no doubt owing to this that it has escaped Dr. McKenzie's otherwise exhaustive purview of the literature of the subject.

Dr. McKenzie states (JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, p. 79, vol. xxviii): "no case of fulminating nasal sinus osteomyelitis has so far been recorded." The following case, I think, may fairly claim to be of the fulminating variety:

A boy, aged fifteen, was seen by me on May 24, 1911, in consultation with my ophthalmic colleague at the Sheffield Royal Hospital, Dr. Stanley Riseley, to whom the case had been referred as one of "orbital abscess." His right eye was completely closed by swelling of the lids, which extended over the forehead up to the vertex, and across the root of the nose to the opposite eyelid.

¹ JOURNAL OF LARYNGOL., RHINOL., AND OTOL., 1912, xxvii, p. 159.

Temperature 104° F., pulse 120. He was delirious; no coherent answers could be got from him, except that he had a bad headache and pain in the chest. The right middle turbinal was swollen, and there was pus in the right nostril. Respirations 40. The parents informed me that the pain began in the forehead on May 18. They knew no cause for the illness. There had been no injury and no previous complaint of nasal trouble. His health up to the onset of the present trouble had been good. There was no pre-existing septic focus. I elicited, on inquiry, that he had been to the swimming-baths on the evening of May 17. A rapid operation was done. An incision was made across the forehead for the whole width of both frontal sinuses, and vertically up to the hair line. The scalp was found to be separated from the underlying bone by purplish-brown exudate, such as is usually found in septic otitis when an incision is made before pus has formed. The anterior walls of both frontal sinuses were freely removed. They were full of pus. Free drainage was provided. No relief resulted from the operation, the patient rapidly becoming deeply comatose and dying next day. No *post-mortem* was allowed. It is probable that pyæmic dissemination in the lungs was present and had occurred before he was seen by me.

I should like to refer also to Case No. 3 in the same list ("Proceedings of the Royal Society of Medicine," Laryngological Section, 1912, p. 51) as amplifying Dr. McKenzie's list.

A man, aged seventeen, the subject of chronic ethmoiditis with polypi, developed acute ethmoiditis and frontal sinusitis, and eventually acute frontal osteomyelitis, probably as the result of fresh septic infection resulting from the entry of water into the nose during bathing. In this case also the medical attendant diagnosed and treated the case as one of acute "orbital abscess."

It is, I think, open to doubt whether the "fulminating" variety of frontal osteomyelitis is actually so rare as the literature of the subject would lead one to conclude. Possibly these cases occur and are classed as acute "orbital abscesses," and are so rapidly fatal that their actual origin from the frontal sinuses escapes recognition.

Yours faithfully,

G. WILKINSON.

SHEFFIELD :

March 16th, 1913.

THE NATIONAL BUREAU FOR PROMOTING THE GENERAL WELFARE OF THE DEAF.

LECTURES ON THE CAUSES AND PREVENTION OF DEAFNESS.

Under the title of "Sporadic Congenital Deafness and Syphilitic Deafness," the third lecture of the series on the causes and prevention of deafness, being given under the auspices of the National Bureau for Promoting the General Welfare of the Deaf, was delivered by Dr. J. Kerr Love, at the Royal Sanitary Institute, on Thursday, December 5, 1912. Dr. C. W. Saleeby, F.R.S.Édin., in the chair.

Dr. Kerr Love showed that the deafness which affects children was always, with the possible exception of true hereditary deafness, far commoner amongst the very poor than amongst the well-to-do. Taking the recent censuses of Glasgow as a basis he found that the average number of inmates in one apartment is about 3.19, whilst the average

number of persons in Glasgow houses represented by the Glasgow children at the Langside Institution for the Deaf and Dumb is 3:145. Poverty, neglect and overcrowding, therefore, were the first conditions to be dealt with if deafness was to be prevented. The lecturer proceeded to show that associated with poverty and overcrowding other causes operated, and that the chief of these is untreated syphilis. By a series of twenty family trees exhibited on the lantern screen he showed that of 167 children 30 were still-born; including these there were 74 deaths, and in addition there were 30 deaf or deaf and blind children. Of the remaining so-called healthy children there were 63, and many of these showed when tested by the Wassermann test that they were syphilitic and would in all likelihood become diseased. The most common cause of death was shown to be meningitis. Scarcely any of these children were under treatment, nor were their parents, and they as a rule did not know why their children died or became blind or deaf.

A new point, brought out for the first time by the lecturer, was the proof that syphilis caused congenital deafness. This occurred in four at least of the families examined, and it was probably a rather common cause of congenital deafness. Dr. Kerr Love strongly urged the need for the notification of congenital syphilis, which could easily be effected under the National Insurance Act without any fresh legislation. Thus both parent and child would be put under treatment, and the infantile death-rate and deafness-rate be much reduced. Except as predisposing to deafness and in its association with poverty and overcrowding, the lecturer could not say that alcoholism produced congenital deafness.

We have been asked to intimate that a medical committee has been formed in connection with the Bureau. The committee, which has powers to add to its numbers, consists at present of Mr. Macleod Yearsley (chairman), Dr. J. Kerr Love, Dr. Fremantle, Mr. W. M. Mollison, and Dr. Dan McKenzie.

NOTÆ SUBSCRIPTÆ.

SEVENTEENTH INTERNATIONAL CONGRESS OF MEDICINE, LONDON, 1913.

We understand that a dinner of the combined Sections of Laryngology and Otology will be held at the Hotel Cecil on Tuesday, August 12, at 7.30, and that tickets can be obtained from the Treasurer, Mr. Mark Hovell, 105, Harley Street, London, W., at a price of £2 2s. It has been decided that free invitations will be sent to all foreign members who register their names in the Congress.

Gentlemen wishing to give private entertainments of any kind during the Congress are asked to notify the Secretary of the Entertainments Committee, Mr. Cecil Graham, 17, Upper Wimpole Street, W., in order that there shall be as little clashing as possible.

An excursion to Oxford on Sunday, August 10, will also be arranged. Visitors will be asked to pay their own expenses, amounting to about 10s. 6d. per person. It is possible that the numbers may have to be limited.

Visitors who require hotel accommodation are advised to communicate with Mr. Cecil Graham, who will supply all details.

BOOKS RECEIVED.

Die Laryngealen Erscheinungen bei Multipler Sklerose des Gehirns und Rückenmarks. By Privatdozent Dr. L. Rithi. Wien and Leipzig: Verlag von Joseph Safar, 1907.

Klinik der Serösen und eitrigen Labyrinth-Entzündungen. By Dr. Erich Ruttin. Wien und Leipzig: Verlag von Joseph Safar, 1912.

THE
JOURNAL OF LARYNGOLOGY,
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**THE JARISCH-HERXHEIMER REACTION IN THE ORGAN OF
HEARING AFTER TREATMENT BY SALVARSAN.**

BY KARL THEIMER, M.D.,

Assistant in Dozent, Dr. H. Frey's Department for Diseases of the Ear in the
Kaiser Franz Joseph Ambulatorium in Vienna.

PROF. JARISCH, of Graz, in his article entitled "Therapeutische Versuche bei Syphilis" (*Wiener. med. Wochenschr.*, 1895, Nos. 17-23), was the first to make mention "of a sort of reaction, which manifests itself in an increase in the local appearances of the disease during the first days of the administration of mercury in patients affected with the syphilitic roseola. The individual spots, after from two to five inunctions, or injections, etc., become much more distinct than before, and on this account appear as if they had become much more numerous. This aggravation of the phenomena is followed by an involution which corresponds in rapidity with the intensity of the reaction." In explanation of this fact Jarisch expressed the opinion that the effect of mercury consisted not only in what we may suppose to be a direct antiparasitic action, "but that, like tuberculin and the bacterial proteins, it also induces an (indirect?) chemotatic effect, as a result of which inflammation is set up, and that, apart from its direct action upon the virus of syphilis, it at the same time exercises a healing influence upon the products of syphilis."

To this observation, interesting though it was, no attention was paid—at least no further mention was made of it.

Seven years later HERXHEIMER and KRAUSE, in their work "Ueber eine bei Syphilitischen vorkommende Quecksilberreaktion" (*Deutsche. med. Wochenschr.*, 1902, No. 50), reported a remarkable change in the skin-rash after injection of the insoluble salts of mercury. This change they termed a "reaction" and described as follows: "It only appears when a sufficient quantity of mercury is absorbed suddenly and for the first time. For this reason it need not be looked for when the drug is administered internally, but only when inunction is practised—and then only at the site of inunction—and when the insoluble salts are injected—about 0.1 grm. of the particular salt" (the authors used only hydrarg. salicyl. and calomel for injection). "In from fifteen to twenty-four hours after the injection the appearance of the exanthem as a rule changes more or less. In the first place the number of efflorescences becomes greater. Roseolous spots, which could not formerly be noticed, come to light. In like manner also, almost in every case in which they could be clearly perceived, an undoubted increase in the number of spots was observed. At the same time the efflorescences always showed a marked prominence in the skin, so that they looked more like urticarial than erythematous papules, *i. e.* they present a succulent (oedematous) appearance." "The rash may become confluent. Its colour, which only yesterday was a dusky red, is to-day bright red." The papule is transformed into a bright red area, or becomes urticarial, and pustules acquire an areola of a lively red. "Within thirty-six to forty-eight hours the fresh arterial tint fades to the old dull colour. The efflorescences disappear as a rule without desquamation and without pigmentation, sometimes these phenomena are present, however; or they resume their former appearance." . . . "Naturally the mixed exanthemata also reacted, and likewise those with recurrent, macular and papular or pustular syphilides." . . . "The reaction appeared only after the first administration of a large dose of mercury; never with any later dose, as, for example, when an injection of hydrarg. salicyl. was followed by another of calomel."

The reaction showed itself only in the general exanthem of early syphilis. It was accompanied by a rise of temperature to 100.4° F. by swelling of the lymphatic glands in one case which subsided in twenty-four hours; by intense headache in another case; in third case by pains in the neck which also disappeared in twenty

four hours. Further, the authors observed that "the rapidity of the cure of the rash was directly proportionate to the intensity of the reaction."

The authors then proceed to show that it is not a "mercurial toxidermia" we are dealing with,—not an *intoxication* but a *reaction*. "It is brought about by a hypersensitiveness to mercury of the cells which are affected with syphilis; that is that the mercury in combining with these cells affects them more injuriously" than it does the normal cells. They compare the reaction with that of tuberculin, of mallein and of trichophyton, and with the reaction induced by non-specific substances such as peptones, organic extracts, etc., and with that produced by arsenic in *lichen ruber* and *psoriasis*. In conclusion, the authors publish the findings in the histological examination of a macule at the height of the reaction.

Corroboration of this observation came from all quarters, and since then the reaction has borne the name of the "*Jarisch-Herxheimer reaction*."

With the advent of the new therapeutic epoch in the treatment of syphilis which followed upon EHRlich's discovery of salvarsan, the reaction just described took on a new and deeper significance. It became apparent, namely, that after the administration of salvarsan a typical reaction affecting the syphilitic skin-rash frequently appeared, the characters of which coincided with those described by Jarisch and Herxheimer.

In his *rapport*, "Die Behandlung der Syphilis mit Ehrlich's Arsenobenzol" (*Wien. klin. Wochenschr.*, 1910, Nr. 47), FINGER remarks: "A striking local appearance which occurred in varying intensity in many cases remains to be mentioned—an inflammatory reaction affecting the infiltrations, comparable to the Jarisch-Herxheimer reaction of the syphilitic exanthem, and to the tuberculin reaction. Sclerosis becomes more succulent, and the surrounding parts become œdematous and inflamed, and these changes, which set in from a few hours to one day after the injection, pass away in quite a brief space of time."

Prof. Finger, in the course of his report, makes one more allusion to the Jarisch-Herxheimer reaction: "Like the primary sore, but oftener—indeed almost constantly—the secondary forms show the so-called Herxheimer reaction," and he then gives a detailed description of the appearances together with his own views upon the supposed causes of the reaction.

The reaction is of particular interest at the present moment, when, with increasing experience in the salvarsan treatment, the

disturbances it evokes are being reported from various quarters, disturbances which immediately follow the injection and affect also distant regions. In this connection we have to draw attention to the fact that in syphilitic patients treated with salvarsan there may appear disturbances of the function of organs or parts of organs in which, up to that time, no morbid changes had been evident.

In particular we encounter a series of so-called "salvarsan injuries" affecting portions of the *nervous system*, so that people have begun to talk about a "neurotropic" action of salvarsan.

In otology, Oskar Beck was the first to investigate the phenomena shown in the organ of hearing after injections of the Ehrlich-Hata preparations, phenomena which have attracted the attention both of otologists and of physicians in general who were interested in the question of salvarsan. At the meeting of the Austrian Otological Society on October 31, 1910 (*Monatsschr. f. Ohrenheilk.*, No. 11, S. 1281, No. x), Beck made a brief preliminary reference to four cases in which immediately or shortly after the injection of salvarsan a symptom-complex set in which corresponded to a unilateral complete paralysis of vestibular function, which after a certain time, not too prolonged, ended in an almost complete *restitutio ad integrum*. In the report the case-histories are detailed in full, and at the same time Ehrlich's opinion, which had been obtained, is published, to the effect that this unilateral paralysis of vestibular function is obviously analogous to the Jarisch-Herxheimer reaction.

Shortly after that, Prof. Urbantschitsch, in the general discussion on Finger's communication on salvarsan (*Wien. klin. Wochenschr.*, 1910, No. 48, p. 1733), reported five cases of isolated paralysis of the vestibular nerve after injection of salvarsan, in which he also referred to the cases observed at his clinic and already reported by Beck. In two of the cases a Jarisch-Herxheimer (skin) reaction had simultaneously appeared. Reactive phenomena affecting the vestibular nerve showed themselves in three hours, five hours, three days and five weeks respectively after the injection. In three of the cases the phenomena completely disappeared within from ten to fourteen days; in one case in the seventh week. In one case the attack was still in existence at the time of the discussion, ten weeks after the injection. "This reminded one," said Urbantschitsch in explanation of the phenomenon, "of a transitory neuritis like the degeneration which Röthig found in the vestibular nerve in mice which Ehrlich had converted into dancing-mice by arsacetin." (Röthig had ex-

mined ordinary mice which had been treated with arsacetin—an arsenical compound similar to, but not identical with salvarsan—and had found in them, after large doses, signs of lesions in the labyrinth, so that they behaved like the well-known Japanese dancing-mice, in whom a congenital hypoplasia of the labyrinth exists.) “It is true,” Urbantschitsch goes on to say, “as Prof. Ehrlich informed me, that the experiments with ‘606’ on animals revealed no such changes as those which had appeared after treating white mice with arsacetin. On the other hand, the vestibular disease induced by ‘606’ rendered it evident that reactive phenomena, due to the action of ‘606,’ had been evoked analogous to the Herxheimer reaction in the skin and produced by swelling in the region of the vestibular nerve, whereby the function of that nerve was affected.” Beck further enlarged upon this in his work on the cases observed in the clinic of Urbantschitsch, “Ueber transitorische Fasererkrankung des Nervus vestibularis bei mit Ehrlich-Hata 606 behandelten Kranken” (*Med. Klinik*, 1910, Nr. 50). He minutely describes four cases of disease confined to the fibres of the vestibular branch after injection of “606.” All the canons of evidence are satisfied by cases 3 and 4. In the third case, in which the vestibular apparatus had been found to be normal before the injection, the circumscribed left-sided vestibular paralysis, which appeared on the third day after the injection, was found to be combined with changes in the syphilitic cutaneous phenomena corresponding to the Herxheimer reaction. The vestibular reaction was found to be normal fourteen days later. The fourth case is still plainer. Five hours after the injection a distinct Jarisch-Herxheimer in the skin appeared, accompanied at the same time with violent vertigo, nausea, nystagmus, etc., and with unilateral paralysis limited to the vestibular nerve. Fourteen days later there was a return to the normal. The first case does not, strictly speaking, furnish clear proof, since there was no otological examination until five weeks after the injection, and the patient had had some deafness and had suffered also from tinnitus prior to the treatment with “606.”

Beck regards this limited paralysis as a *Herxheimer reaction in the region of the eighth nerve*. At first he had looked upon it as a transitory neuritis, reminding one of Röthig's mice and of the cases of Leidler and Ruttin. In the meantime, however, Ehrlich, who had been made aware of the facts, expressed the view that it was possibly a reaction akin to the Herxheimer reaction, “which expressed itself in a local swelling, and in this way produced an

injury of the nerve," and to this opinion Ehrlich ("Ehrlich-Hata, Experimentelle Chemotherapie der Spirillosen") adheres. The fourth case detailed above unquestionably proves the truth of this view.

I have referred to the literature in so far as it is accessible to me, in order to cite the cases in which a symptom-complex appeared after injection of salvarsan, which resembled that found in the Urbantschitsch-Beck cases, and which in like manner disappeared. I have not limited myself, however, to those cases in which the vestibular nerve alone was affected, but have also collected those in which the cochlear nerve alone and those in which both the cochlear and the vestibular nerves were attacked.

I have been successful in collecting the following cases which are arranged in order of time.

Finger ("Die Behandlung der Syphilis mit Ehrlich's Arsenobenzol," *Wien. Klin. Wochenschr.*, 1910, Nr. 47, S. 1472). Patient, aged twenty-two, treated on August 24 with 0.5 (? grm.) neutral. On August 25 he showed, as was ascertained at the ear clinic, nystagmus and vertigo, with the typical direction in falling. The hearing was intact. Diagnosis by the ear clinic: *Isolated paralysis of the vestibular function, disappearing in a few days.*

Biehl (*Wien. klin. Wochenschr.*, 1910, Nr. 50, "Protokoll der k. k. Gesellsch. der Aerzte Wiens," S. 1825), in the discussion on Finger's communication, referred to a remarkable case. Ulcerating gumma of the pharyngeal wall: Both acoustic nerves normal on admission. On November 4 salvarsan intra-muscularly. Next day rise of temperature to 99.8° F. On November 8, vertigo; malaise; disturbances of equilibrium; horizontal nystagmus to the left. Hearing was no worse. On November 10 all the phenomena had passed away. As the skin did not manifest the Jarisch-Herxheimer reaction, Biehl did not reckon this case as an instance of the Herxheimer reaction. All the same, the case should be considered as a Herxheimer.

Beck, Oskar (*Monatsschr. f. Ohrenheilk.*, xlv, Jahrgang 1911, 2 Heft, "Sitzungsbericht der Österreich. Otolog. Gesellsch. do. 30/1. 1911, S. 233. Nr. xiv). Isolated transitory paralysis of the vestibular nerve (two cases) after intra-muscular and intra-venous injection of salvarsan. The first case does not correspond with the Jarisch-Herxheimer reaction, since the phenomena did not appear until fourteen days after the injection. The second case, on the other hand, is a model of the Jarisch-Herxheimer reaction in the region of the vestibular nerve; six hours after the intra-venous injection complaints of unbearable vertigo and nausea. Examination of the ear revealed an isolated paralysis of the vestibular nerve. Next day the child was well and free from vertigo; no further spontaneous nystagmus, and the vestibular nerve reacted normally again.

Sellei ("Ueber einige Nebenwirkungen des Salvarsans," *Münch. med. Wochenschr.*, 1911, Nr. 7, S. 351). It is the second case which interests us. The day after the second injection Herxheimer's reaction in the skin and tinnitus in the right ear. Pot. iodid. given; tinnitus disappeared; some hardness of hearing in the left ear. The chronic otitis media, which was now recognised, was obviously exacerbated. Sellei looked upon the phenomena as Herxheimer, but his examination is not exact. Still, the picture was blurred by the administration of Pot. iodid., and is not to be too closely criticised.

Gérôme and Guttman ("Zur Frage der Neurotropie des Salvarsan," *Ber. klin. Wochenschr.*, 1911, Nr. 1, S.451). The authors briefly remark that one case (a woman of thirty years) had a definite Herxheimer reaction after injection (vertigo, tinnitus); further, that six to seven weeks after injection a unilateral affection of the cochlear nerve appeared, and the symptoms subsided after the second injection. No further details are given.

Besides these we have to consider a case reported by Peritz (*Zentralblatt f. Ohrenheilk.*, Bd. ix, S. 247, *Bericht der Berlin. otolog. Gesellsch.*). In a case of cerebral syphilis, unilateral tinnitus and hardness of hearing appeared. After two subsequent injections of salvarsan the phenomena passed away.

Rille's case (*Berl. klin. Wochenschr.*, 1910, Nr. 50, "Ueber eventuelle Nebenwirkungen an den Hirnnerven bei Behandlung mit Ehrlich's Präparat, 606") is not quite certain in spite of the appearance of a Herxheimer cutaneous reaction, since not only the cochlear and vestibular nerves, but also later on the facial and optic were attacked.

This *résumé*, short though it is, is sufficient to show that the cases are characterised by the rapid appearance of symptoms referable to the internal ear a very short time after the salvarsan injection, and by their equally rapid disappearance.

As is well known, since the introduction of the salvarsan treatment a not inconsiderable number of cases has been described in which injury to the internal ear had to be recorded. Such cases are very different from those we are dealing with, not only as regards their onset and progress, but also as regards their pathology.

From the records now at our disposal we are able to group cases described as salvarsan-injury of the internal ear in the following manner:

(1) Affections of the internal ear, of the vestibular or of the cochlear apparatus alone, or of both together, in patients who are already the subjects of an aural lesion. In some of these cases the phenomena disappear in the course of time, some after repeated salvarsan treatment, some after mercurial treatment. In others the lesions prove to be permanent.

(2) Affections of one or both sections of the internal ear in persons whose ears have been previously proved to be normal. The phenomena appear a long time—weeks or months—after injection. Here, also, the symptoms may disappear after a time, or they may persist.

(3) Affections of one or both sections of the internal ear in persons whose ears have been previously proved to be normal, appearing immediately or shortly after the injection. They persist for a long time, and may prove to be permanent.

(4) An affection of the internal ear, attacking by preference the

vestibular apparatus solely, which appears immediately, or soon after the injection, and disappears as rapidly—at most within a few days—and so completely that the phenomena become absolutely normal again.

Plainly it is the last group only which corresponds to the Jarisch-Herxheimer reaction, and as our task at present does not consist in discussing all the ear symptoms which, rightly or wrongly, have been ascribed to salvarsan,¹ we shall confine our attention solely to Group 4.

We have already seen that in many persons affected with syphilis the administration of mercury or salvarsan induces a reaction which expresses itself in swellings, etc., of the skin-rashes, and which is characterised by a rapid subsidence. We have, therefore, come to the conclusion that those affections of the internal ear—usually limited to the vestibular nerve—alluded to in Group 4, which appear immediately after the administration of the salvarsan and as rapidly disappear, should be regarded as the same sort of reaction. Inasmuch, however, as that reaction has been shown to appear only in places where there are already syphilitic changes in existence, we are led to the further conclusion that in cases belonging to Group 4 syphilitic changes in the eighth cranial nerve must have previously been in existence. Otherwise there would be no local cause for the incidence of the Jarisch-Herxheimer phenomenon, and we should be compelled to look upon these cases as due purely to the toxic action of the salvarsan—an assumption for which we have no support.

It is certain, on the other hand, that syphilitic changes, possibly of the nature of a peri-neuritis, can exist in these nerves, of too slight a nature to cause subjective troubles or to be demonstrable by the methods of examination at our disposal. If now at the site of these lesions a reaction is set up in consequence of the treatment by salvarsan, exceeding the original lesion in extent by reason of an increase in bulk of the diseased tissue, then the sudden onset of the symptom-complex described above would readily occur. Moreover, the function of a nerve like the eighth, whose fibres traverse a narrow bony canal, will be more readily impaired in this way than that of those nerves which course through soft parts.

This explanation is quite in keeping with the rapid subsidence of the symptoms and the return to the normal.

¹ H. Frey, "Ueber das Vorkommen von Erkrankungen des inneren Ohres in frühen Stadien der Syphilis," *Wien. klin. Wochenschr.*, 1911, No. 11, *JOURN. OF LARYNGOL., RHINOL., AND OTOL.*, April, 1913, p. 215.

Thus, *the only cases of injury to the internal ear after salvarsan* which can be described as manifesting the Herxheimer reaction are those in which *the phenomena appear shortly after the injection and rapidly disappear*. The disturbances affect the vestibular portion of the nerve for the most part, and, as a rule, induce the clinical appearances of a complete paralysis of the vestibular apparatus. At the same time rapidly appearing and disappearing disturbance of the cochlear apparatus may also be included under this heading.

It is worthy of note that isolated paralysis of the vestibular nerve after salvarsan has recently been observed more frequently, while its occurrence in consequence of some other cause has been observed but seldom (Leidler, Ruttin, Neumann, Bárány).

What relationship may exist between the cases described in Group 4 and those in Group 3, in which similar phenomena appear as suddenly, but take a much longer time to disappear, it is impossible for us to say in the present state of our knowledge. Further observation will, no doubt, supply us with the explanation.

If the number of cases which we can with certainty look upon as instances of the Jarisch-Herxheimer reaction in the neighbourhood of the eighth nerve is not yet very great in proportion to the cases of neuro-recurrence of that nerve, the reason is no doubt to be found in the fact that sufficient attention has not yet been paid to this symptom-complex. Perhaps the publication of this paper may aid in evoking a larger number of reports, so that our knowledge of this subject may be still further expanded.

Postscript.—Since the conclusion of the foregoing article there has appeared a publication by O. Kren, "Schlussbericht über die Erfahrungen mit Salvarsan" (*Wien. klin. Wochenschr.*, 1913), in which another case of Herxheimer in the ear is mentioned.

D. M., Trans.

**REPORT FOR THE YEAR 1912 FROM THE EAR AND THROAT
DEPARTMENT OF THE ROYAL INFIRMARY, EDINBURGH.**

Under the charge of A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E.

PART III.**THE SIGNIFICANCE OF FEVER IN CASES OF MASTOID-
ITIS COMPLICATING ACUTE AND CHRONIC SUPPU-
RATIVE OTITIS MEDIA.**

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WHILST working in the Universitäts Ohrenklinik at Vienna during 1911 and 1912 the writer was somewhat surprised to hear it dogmatically stated by such authorities as Neumann and Ruttin that mastoiditis of itself did not cause the temperature to rise above 99° or 100° F. On returning to Edinburgh in April, 1912, the writer obtained from Dr. Logan Turner permission to analyse all the cases of acute mastoiditis treated in the Department during the years 1910 and 1911 in order to test the accuracy of this statement.

The following statistics have been compiled from the case records, which are made by Dr. Logan Turner or by Dr. J. S. Fraser, who not only examine the cases on admission but write up the notes of the findings at operation.

During the years 1910 and 1911, 125 cases were operated upon in which there was an acute mastoiditis complicating an acute or chronic suppurative otitis media. The cases of chronic otorrhœa which underwent the complete operation because conservative treatment failed to cure the discharge have been excluded, because in them there was never any question of acute mastoiditis, nor was there any elevation of temperature before operation.

In 96 of the 125 cases (77 per cent.) the temperature never reached 100° F.: 17 of the cases were under five years of age—it is interesting that in none of these the temperature reached 100° F.; 35 of the cases were between five and fifteen years of age, the remainder (73) were over fifteen.

In the remaining 29 a temperature of 100° F. or more was recorded prior to operation. In all, 62 cases complicated acute and 63 chronic otitis media.

It is unnecessary to give a detailed account of all the cases in which there was no rise of temperature before operation: two typical instances have, however, been selected.

CASE 1.—Male, aged fourteen, suffered from acute suppurative otitis media and mastoiditis. The maximum temperature before operation was 98° F. A subperiosteal abscess was present and the mastoid cortex was eroded: the cells contained pus and granulations. The maximum temperature after operation was 98° F.

CASE 2.—J. S.—aged eighteen—suffered from chronic suppurative otitis media with acute mastoid complication. Maximum temperature before operation 98° F. There was tenderness over the mastoid, and the antrum contained pus and polypoid mucosa. Maximum temperature after operation 98.2° F.

If we turn to the 29 cases in which a temperature of 100° F. or over was recorded before operation we find that in 26 the following conditions were found: 1, pulmonary tuberculosis and hectic; 1, a septic throat and septicæmia; 6, septic thrombosis of the sigmoid sinus; 6, a perisinus abscess, but no thrombosis; 4, meningitis; 2, temporo-sphenoidal abscess; 1, large extra-dural abscess involving the middle and posterior fossæ, and a collection of pus between the upper surface of the cerebellum and the tentorium cerebelli; 1, extra-dural abscess in the middle fossa; 1, osteo-phlebitic septic pyæmia; 1, serous meningitis; 2, healthy mastoid antrum.

The condition in the four last cases was as follows:

CASE 1: *Osteo-phlebitic Septic Pyæmia*.—M. S.—, female, aged sixteen. Chronic middle-ear suppuration. Maximum temperature two days before operation, 103° F. She had a rigor two days before, and another the day before admission. Slight mastoid tenderness was present. The antrum contained thick pus and cholesteatomata. The roof of the antrum was rough and carious; there was no perisinus abscess. The temperature remained normal after operation, and the patient recovered without any further complications.

CASE 2: *Serous Meningitis*.—J. N.—, female, aged sixteen. Chronic middle-ear suppuration. Maximum temperature before operation 100° F., the day after operation 100° F. She complained of giddiness. There was slight spontaneous nystagmus to the affected side; occasional vomiting; Kernig's sign present. A little dirty fluid was found in the antrum, and some granulations in the tympanum. No further symptoms developed.

CASE 3: *Healthy Antrum*.—A. D.—, female, aged fourteen. Maximum temperature before operation 103° F. For three days after operation the temperature rose above 100° F., and then fell to normal. There was fulness and swelling in front of the right ear extending as far forward as the right eyelid. The mucous membrane of the antrum was slightly inflamed; no pus was present. A painful, fluctuating swelling of the right elbow developed, and gradually got better. There was some general tenderness of the abdomen.

CASE 4: *Healthy Antrum*.—S. F.—, female, aged fifty-seven. Maximum temperature before operation 102.6° F. It fell below 100° F. on the fourth day after operation. There was acute otitis media, the membrane ruptured the day after admission. Mastoid tenderness but no œdema. The patient vomited on the day of admission and on the day after some tenderness was complained of in the neck. There was no pus in the antrum or mastoid cells. No explanation was found for the tenderness in the neck.

With regard to the remaining three cases in the group of 29

which had temperatures of 100° F. or upwards the following points of interest are noted.

CASE 1. B.D——, female,—aged seventeen. Acute otitis media. She had a temperature of 101° F. three days before operation. Bier's congestion was tried for two days. On the day of operation the temperature rose to 101·6° F. The cells were pneumatic and acutely inflamed. There was a trace of pus in the aditus. She gave a history after operation of vague pains at night low down in the abdomen.

CASE 2. C.McD——, female, aged forty-seven. Acute otitis media. Maximum temperature before operation 101·8° F. A little pus was found in the tip and intermediate cells, and also in the antrum. The bone over the sinus was healthy and not removed.

CASE 3. A. C——, male, aged twelve. Chronic middle-ear suppuration; maximum temperature before operation 101° F, after operation 99·2° F. The temperature of 101° occurred ten days before operation; apart from this it was occasionally 99° F. Mastoid sclerosed, antrum large, with some cholesteatoma in it.

The above three cases make a percentage of 2·4 in the whole series with a temperature of 100° F. or over before operation, and they are the only cases in which the temperature may be fairly attributed to the mastoiditis.

Among the twenty-nine cases having temperatures there were six suffering from perisinus abscess. It must not be thought, however, that a perisinus abscess always causes a high temperature, because there were in the series of 125 cases twenty-two cases of perisinus abscess in which there was no temperature. It may also be noted that there were two cases of acute labyrinthitis in the series, neither of which exhibited any temperature.

CONCLUSIONS.

(1) In 96 of the 125 cases (77 per cent.) of acute mastoiditis complicating acute and chronic otitis media there was no fever (temperature of 100° F. or over).

(2) Of the remaining twenty-nine cases in which fever was present an intra-cranial complication was found in twenty-two cases, while in two the temperature could be explained by the presence of such conditions as septicæmia and pulmonary tuberculosis. In two cases there was no mastoiditis.

(3) In only three of the cases (2·4 per cent.) no condition other than the mastoiditis was found at operation to account for the fever.

Thus mastoiditis of itself very rarely gives rise to fever (temperature of 100° F. or over); if fever be present we must suspect an intracranial complication or some general toxic condition.

STATISTICAL TABLES.

BY N. HAY BOLTON, M.B., CH.B.,
House Surgeon.

AFFECTIONS OF THE NOSE.

(2066)

I. *The External Nose.*

Deformities	2
Injuries	11
Collapse of alæ nasi	1
Abscess of vestibule	1
Dermatitis of vestibule	45
Herpes of external nose	1
Lupus	2
Gumma	1
Chilblain	2
Sebaceous adenoma	1
Dermoid cyst	2
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	69

II. *The Nasal Cavities.*

Deflection of septum to right	284
Deflection of septum to left	295
Irregular deflections	88
Hæmatoma of septum	1
Abscess of septum	2
Perforations of septum	17
Bleeding polypus of septum	1
Ulcer of septum	2
Acute, subacute, and chronic rhinitis	335
Inferior turbinal enlargement	510
Polypoid middle turbinals and nasal polypi	146
Purulent rhinitis	59
Atrophic rhinitis (non-fœtid)	26
Atrophic rhinitis (fœtid)	39
Rhinitis sicca	30
Rhinitis caseosa	1
Epistaxis	37
Lupus of mucous membrane	11
Syphilitic disease (tertiary)	12
Retention cyst in floor of nose	2
Foreign bodies	11
Nasal neuroses (including asthma)	88
	<hr/>
	1997

ACCESSORY NASAL SINUSES.

(92)

Acute antral catarrh	1
Acute antral suppuration	5
Chronic antral suppuration	29
Naso-antral (choanal) polypi	9
Acute frontal sinus catarrh	4
Acute frontal sinus suppuration	4
Chronic frontal sinus suppuration	4
Chronic ethmoidal sinus suppuration	4
Chronic fronto-maxillary suppuration	7
Chronic frontal, ethmoidal, and antral suppuration	4
Chronic fronto-ethmoidal suppuration	1
Chronic sphenoidal suppuration	3
Chronic sphenoidal and ethmoidal suppuration	1

Chronic frontal, sphenoidal and ethmoidal suppuration	1
Chronic ethmoidal and antral suppuration	5
Chronic ethmoidal, antral, and sphenoidal suppuration	1
Pansinusitis	2
Dental cyst invading antrum	2
Orbital abscess	1
Thrombosis of cavernous sinus	1
Caries of superior maxilla	1
Syphilitic disease of frontal bone	1
Malignant disease of antrum	1
	<hr/>
	92

DISEASES OF THE NASO-PHARYNX, PHARYNX AND FAUCES.

(1574)

Adenoids and enlarged tonsils	1237
Enlarged Eustachian cushions	1
Congenital choanal atresia	1
Fibrous tumour of naso-pharynx	1
Malignant disease of naso-pharynx	1
Acute tonsillitis	51
Peritonsillar abscess	25
Diphtheria	3
Acute catarrhal pharyngitis	20
Edematous pharyngitis	4
Acute inflammation of lingual tonsil	1
Chronic pharyngitis, including granular pharyngitis	91
Pharyngitis sicca	28
Kerato-sis pharyngis	7
Elongated and bifid uvula	2
Hypertrophy of lingual tonsil	10
Lupus	1
Tuberculosis	1
Syphilis (secondary)	7
Syphilis (tertiary)	15
Papilloma of anterior pillar	1
Cyst of tonsil	6
Sarcoma of tonsil	2
Epithelioma of fauces	9
Foreign bodies	18
Paralysis of soft palate	3
Sensory neuroses	28
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	1574

AFFECTIONS OF THE BUCCAL CAVITY.

(32)

Cleft palate	1
Tongue-tie	1
Injury to palate	1
Tertiary syphilis of palate	11
Acute glossitis	1
Stomatitis	5
Nævus of tongue	1
Tertiary syphilis of tongue	1
Pyorrhœa alveolaris	1
Malignant disease of tongue	1
Leucoplakia of tongue	3
Simple tumour	1
Subperiosteal abscess of alveolus	1
Salivary calculus	2
Malignant disease of floor of mouth	1
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	32

AFFECTIONS OF THE LARYNX AND TRACHEA. (173)

I. *Acute.*

Acute catarrhal laryngitis	33
Acute oedematous laryngitis	2

35

II. *Chronic.*

Chronic catarrhal laryngitis	24
Laryngitis sicca	12
Vocal nodules	9
Pachydermia	1
Lupus	1
Tubercular disease	27
Syphilitic disease (tertiary)	5

79

Simple: III. *Tumours.*

Papilloma	2
Fibroma	3

Malignant:

Epithelioma—

Intrinsic	4
Extrinsic	7

16

IV. *Affections of Nerves.*

Functional aphonia	13
Abductor paralysis (left)	5
Abductor paralysis (bilateral)	2
Complete recurrent paralysis (right)	2
Complete recurrent paralysis (left)	4
Sensory laryngeal neurosis	4

30

V. *Miscellaneous.*

Stenosis (cause unknown)	1
Goitre	11
Gumma of trachea	1

13

AFFECTIONS OF HYPOPHARYNX AND ŒSOPHAGUS. (30)

Stricture:	
Simple	5
Malignant	7
Neurosis	9
Foreign body	9

30

AFFECTIONS OF THE EAR. (1835)

I. *The External Ear.*

Congenital malformations	3
Abscess of lobule	2
Cerumen	311
Furunculosis	35
Otitis externa diffusa	50
Otomycosis	1
Erysipelas	1
Hyperostosis	3

Foreign bodies	6
Injury to meatus	4
Malignant disease	1
Aural neuralgia	7

424

II. *The Middle-ear Cleft.*

Traumatic rupture of tympanic membrane	2
Eustachian obstruction :	
Right	28
Left	27
Bilateral	236
Acute non-suppurative otitis media :	
Right	26
Left	23
Bilateral	23
Chronic non-suppurative otitis media :	
Right	15
Left	14
Bilateral	91
Acute suppurative otitis media :	
Right	44
Left	40
Bilateral	8
Acute suppurative otitis media with mastoid complications :	
Right	15
Left	12
Chronic suppurative otitis media :	
Right	132
Left	141
Bilateral	117
Chronic suppurative otitis media with mastoid complications :	
Right	29
Left	23
Tubercular otitis media :	
Right	5
Left	4
Bilateral	1
Sequelæ of chronic middle-ear suppuration :	
Right	53
Left	47
Bilateral	65
Intra-cranial complications of suppurative otitis media :	
Extra-dural abscess	1
Temporo-sphenoidal abscess	3
Cerebellar abscess	2
Sigmoid sinus thrombosis	4
Thrombosis of jugular bulb and vein	4
Peri-sinus abscess	2
Purulent meningitis	4
Otosclerosis	26
Mixed middle- and inner-ear deafness (non-suppurative)	45

1312

III. *The Internal Ear.*

Internal ear affections :	
Congenital (including deaf-mutism)	16
Traumatic	4
Occupational	4
Labyrinthine suppuration	7

Cerebro-spinal meningitis	1
Influenza	2
Enteric	1
Scarlet fever	1
Tumour of base of brain	1
Congenital syphilis	11
Acquired syphilis	1
Ménière's symptom-complex	2
Neuritis	2
Functional	6
Senile changes	7
Unknown causes	34
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	100

MISCELLANEOUS CASES.

(183)

(These include cases sent from other wards in the hospital with negative findings, enlarged cervical glands, skin diseases, headaches of obscure origin, mental defects, eye cases, carious teeth, etc.)

TABLE OF OPERATIONS.

The Nose.

Setting nasal fractures	3
Dermoid cyst	1
Abscess and cysts of vestibule and sputum	3
Septal spurs	2
Submucous resection	141
Foreign body	2
Curetting for lupus	7
Turbineotomy	140
Nasal polypi	131
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	430

The Accessory Sinuses.

Proof puncture of antrum	94
Antrum:	
Intra-nasal	5
Radical, including naso-antral polypi	30
Frontal:	
Radical	10
Ethmoid curetting	5
Sphenoidal sinus	3
Dental cyst	2
Orbital abscess	1
Alveolar abscess	1
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	151

The Pharynx.

Adenoids and tonsils	959
Enucleation of tonsils	88
Peritonsillar abscess	13
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	1060

The Larynx, Trachea, and Oesophagus.

Tracheotomy	7
Removal of laryngeal papilloma	3
Bronchoscopy	5
Oesophagoscopy	37
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	52

The Ear.

Furunculosis	9
Paracentesis	32
Eustachian tube curetted	1
Aural polypi	55
Opening abscess over mastoid	5
Plastic	11
Acute mastoiditis (Schwartz)	30
Modified radical	1
Radical mastoid	76
Labyrinth operation	3
Opening sigmoid sinus	4
Jugular ligature	4
Cerebrum explored	1
Cerebellum explored	1
Temporo-sphenoidal abscess	2
Extra-dural abscess	1
Drainage of meninges	2
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	238
Injection of salvarsan	3

ANÆSTHETICS.

Local anæsthesia	640
Ethyl chloride	1013
Chloroform	103
Chloroform and ether	137
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	1893

New patients during 1912 = 3364.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE.—OTOLOGICAL SECTION.

January 17, 1913.

DR. J. DUNDAS GRANT, *President of the Section, in the Chair.*

*Abridged Report.***A Discussion on the Treatment of Meningitis of Otitic Origin.**

OPENED BY **William Milligan, M.D.**—Despite all that has been written there is still considerable diversity of opinion as to what actually constitutes meningitis, and as to the exact relationship between lepto-meningitis *serosa* so-called and lepto-meningitis *purulenta*. While many observers look upon the former as the forerunner of the latter, others consider the two diseases as distinct entities, while there are still others who deny the existence of any such disease as serous meningitis (Körner, Luc). That a type of otitic meningeal inflammation exists to which the name meningitis *serosa* may be fairly applied I have personally no doubt, and that it is the forerunner of all cases of purulent meningitis is a point I hope to make in the following argument. Clinically, its presence is

indicated by such symptoms as headache, vomiting, stiffness of the muscles of the neck, and increase of arterial tension. Upon tapping the lumbar theca the cerebro-spinal fluid spurts out under pressure: is, as a rule, clear, although it may be slightly turbid: has a specific gravity of 1005-1008, and an alkaline reaction. It may contain a few lymphocytes and polymorphonuclear leucocytes.

Considered from a pathological standpoint, it is undoubtedly convenient to divide meningitis into such subdivisions as serous, plastic, fibrinous and purulent, but from the therapeutic point of view these subdivisions are arbitrary, and are merely so many phases in the evolution of a progressive disease, whose invariable termination, unless nipped in the bud, is death. That the disease is not necessarily fatal, provided an early diagnosis be made and prompt treatment instituted, is evident from the published records of carefully observed and authentic cases. Successful treatment depends upon early diagnosis and early drainage. Special knowledge is required in order to make an early diagnosis, and courage to operate in the absence of the full *ensemble* of text-book symptoms.

Why in meningitis is there an increase, and often a very rapid increase, in the amount of cerebro-spinal fluid? Why does not this increased exudate pass into the circulation, there to be dealt with? These and other such problems demand careful consideration.

For practical purposes meningitis may be divided into two main types: (1) localised, and (2) diffuse; and into subdivisions according as it attacks the external surface of the dura or the subdural spaces.

The treatment of that localised form known as extra-dural abscess is so well understood that I do not propose to discuss it beyond remarking that, in my experience, it is a more common complication of acute than of chronic otitis media, and more frequently found in the posterior than in the middle fossa, and also that I have frequently encountered such extra-dural collections of pus when their existence was quite unsuspected. It is quite a different matter, however, when ulceration of the dura has taken place and infective organisms have reached the subdural spaces. It is true that localised collections of pus are found in the subdural space, but the tendency here is to generalised suppuration, as the defences thrown out by Nature are rarely strong enough to resist repeated bacterial attacks. Such localised subdural collections of pus are rarely diagnosed, but are occasionally found in the course of exploratory operations.

In purulent lepto-meningitis, for a time the infective process remains localised to the neighbourhood of the original focus of septic disease, but tends to become diffuse and generalised. The fact, however, that it remains for a time, at any rate, localised, deserves to be more appreciated, for it is at this stage that operative interference is most likely to prove successful. Exacerbations of temperature denote to my mind invasion of fresh areas of tissue, and, therefore, of an advance of the disease, and are consequently important signals. It is useless to await the advent of all the classical signs and symptoms. By the time they are in evidence the patient is, as a rule, beyond the hope of surgical intervention. An intelligent appreciation of the course of pathological events, and an analysis of the cerebro-spinal fluid—the keystone to the situation—materially assist in making an early diagnosis and in instituting a rational line of treatment. Under normal circumstances the mechanism controlling the secretion of cerebro-spinal fluid and its ultimate passage into the venous system is so delicately poised as to ensure an equable pressure. Let this mechanism be disturbed ever so slightly by factors which tend either to

cause an increased exudation or to prevent the passage of fluid through the Pacchionian bodies, and we have at once certain changes induced, changes which are capable of being accurately registered by modern chemical tests.

Under normal circumstances the cerebro-spinal fluid is under slight pressure, 20 to 30 mm. of mercury, has an alkaline reaction, and a specific gravity of from 1005 to 1008. It may be secreted in great amount as the result of some peripheral focus of irritation, with, as a consequence, the various signs and symptoms of increased intra-cranial tension, but so long as it is able to deal with any bacterial attack it remains alkaline and more or less clear. Increased turbidity, however, does not mean that it has become septic, but that there has been a marked leucocytosis; in other words, a supreme effort to ward off invasion. Diminishing alkalinity denotes to my mind progressive bacterial invasion, while an acid reaction indicates that definite purulency has become established.

My opinion is that all cases of purulent meningitis are preceded by a stage of serous meningitis, when a desperate fight is made by the meninges and cerebro-spinal fluid to resist bacterial invasion. To attain victory, cerebro-spinal fluid has to be secreted in such quantity that the patient may become almost comatose from increased intra-cranial tension. If, however, operative interference be undertaken at this stage and the focus of infection removed, with, at the same time, a fair amount of cerebro-spinal fluid, recovery not uncommonly follows.

Transition from the serous to the purulent type of cerebro-spinal fluid is not necessarily, however, indicated by the presence of bacteria. It may and does take place before any bacteria are discovered in films or cultures, as what we have to deal with is the inter-reaction between the toxic by-products of bacterial life and living tissues. It is consequently to the chemistry of the cerebro-spinal fluid that we have to look for the earliest indications of pyogenic invasion. Careful analysis will reveal delicate pathological changes at a time considerably anterior to that at which the more gross clinical symptoms manifest themselves. Metabolism of the products of bacterial life is such as to destroy or partially destroy the existing carbohydrates or proteins in the cerebro-spinal fluid. In the presence of bacterial infection of the cerebro-spinal fluid the existing carbohydrates become rapidly used up, with the result that in purulent meningitis there is an absence of this copper reduction. Hence we have apparently a certain test (Kopetzky) of determining when serous meningitis is becoming purulent. In addition the percentage of solids is increased, more especially the percentage of albumen. On boiling normal fluid a faint haze from the coagulation of albumen is noted. In purulent meningitis the amount increases at times to as much as 1 per cent.

A progressive and at the same time diminishing alkalinity of the cerebro-spinal fluid, or a definite acidity, provides another useful bedside test of what is taking place. Several observers, among others Araki and Zillensen, have shown that in the presence of a lack of oxygenation there is a production of lactic acid in the living tissues. Where metabolism is upset as the result of some septic process, where in other words production is in excess of elimination, acidosis is induced, and it is to this artificial acidosis that the acid reaction of the cerebro-spinal fluid is due. So long as the cerebro-spinal fluid remains alkaline, even though turbid, there is reason to expect a good result from operative interference, but should it become turbid and acid the prognosis is grave.

In the early stages of meningitis the cellular elements found in the cerebro-spinal fluid are very much the same as those found in normal

fluid. Occasionally a few lymphocytes in various stages of disintegration and a few polymorphonuclears are to be seen. Later on there is an enormous increase in the number of leucocytes, chiefly polymorphonuclears, and a moderate increase in the number of lymphocytes. Bacteria are not found in films or in cultures in the early stages of the disease. As the disease progresses they are as a rule easily detected, either intra- or extra-cellular. The commonest varieties found are streptococcus, staphylococcus, a Gram-diplococcus, and Friedländer's bacillus.

Coincident with these changes in the cerebro-spinal fluid certain clinical signs and symptoms of diagnostic value make their appearance. Thus the gradual increase of intra-cranial pressure from excessive secretion of cerebro-spinal fluid is accompanied by a simultaneous increase of general blood-pressure and progressive tendency to cerebral anemia. To this progressive increase of intra-cranial tension too much importance cannot be attached. It is in many cases the determining factor in the fatal issue, the cerebral anemia which it induces paralysing the function of one or other of the sensitive vital nerve centres. It is at this stage when the cerebro-spinal fluid, although possibly turbid, is still alkaline and capable of reducing the copper in Fehling's solution, that lumbar puncture as a therapeutic measure is so advantageous. The withdrawal of a quantity of fluid, the amount varying with the pressure under which it escapes through the trocar, by relieving the mechanical symptoms due to increased pressure, tends to ward off profound cerebral anemia and so to give time for the institution of more definite remedial measures.

Another indication of commencing meningitis is found in the presence of an œdema of the optic disc. I have also found in a few cases a lowering of the upper tone limit due to what I take to be similar mechanical causes. Owing to the fact, however, that the labyrinth upon the affected side is so frequently implicated in the primary septic process the test has in such cases to be applied to the labyrinth of the opposite ear.

In the early stages of meningitis, repeated or continuous drainage through the lumbar theca, in addition to the removal of the primary focus of infection, may bring about a complete cure. Ventricular drainage, although it may find a place in the treatment of non-pyogenic meningitis, entails the risk of infecting a previously non-infected ventricle as well as the cerebral substance through which the knife or needle has to pass. Lumbar puncture is to my mind much more a diagnostic than a therapeutic measure, and although in mild cases it may succeed in bringing about a cure, is not to be relied upon. Even continuous lumbar drainage, which *a priori* might have been expected to be efficient, fails after a time because, as fluid is continuously withdrawn, the brain stem sinks down into the foramen magnum, with the result that it is prevented from flowing from the distended ventricles into the spinal theca. A more effective and more rapid method of drainage is necessary, such as is obtained by trans-labyrinthine drainage or one or other form of decompressive operation. The internal administration of urotropine is said to have a beneficial effect, and to assist in keeping the cerebro-spinal fluid aseptic. Its rapid elimination, partly as formaldehyde, and the fact that it is found in the cerebro-spinal fluid soon after its administration by the mouth, has given rise to the idea that it might possess a certain antiseptic value, in addition to which Barton and Brown maintain that it is also found in the secretion from the infected ear.

When, in serous meningitis, the labyrinth is the primary focus of

infection, its complete removal, with, in addition, the establishment of trans-labyrinthine drainage as recommended by West and Scott, may prove efficient. In preference, however, to trans-labyrinthine drainage, I am in favour of a decompression operation in the posterior fossa at some distance from the original focus of labyrinth suppuration.

Opinions differ as to the actual value of serum therapy and vaccine treatment in cases of purulent meningitis. While not denying that the administration of an autogenous vaccine may help, my experience has been to regard it merely as an adjuvant.

To be successful any treatment of otitic purulent meningitis presupposes elimination of the primary focus of infection, whether it be a middle or an internal ear suppuration, or, as is so frequent, of the two combined. The internal ear is not only by far the most frequent avenue of infection to the meninges, but is also the most dangerous because it leads to direct infection of the posterior fossa. In actual practice, cases of what one might name "tympanic meningitis" are not nearly as fatal as cases of "labyrinthine meningitis." In the former the resulting meningeal infection is likely to be localised, whereas in the latter there is a tendency to rapid diffusion, while from the conformation of the parts operative interference is considerably more difficult. When, therefore, infection is by way of the internal ear, as can usually be established by the employment of the labyrinth tests, a complete labyrinthectomy in addition to a complete post-aural operation should be performed. Assuming, however, that there is no evidence of any localised collection of pus, but that we have to deal with a spreading meningitis, the difficulties of treatment are enormously increased. The objects to be borne in mind after removal of the primary focus of infection are: (1) The relief of intra-cranial pressure; (2) the establishment and maintenance of free drainage from the meninges; and (3) the overcoming of the existing toxæmia.

In undoubted purulent meningitis lumbar puncture has no place other than as a means of diagnosis. Some form of decompressive operation is culled for, the essential feature of which is to provide by a sufficiently free removal of bone a window large enough to relieve existing pressure, and at the same time to provide a means of freely draining the infected meninges. A window having been made either in the temporo-sphenoidal or cerebellar area, the dura will be found to bulge into the opening and to cork it up. Some operators content themselves with the making of such a window and with the relief of pressure thus obtained. No doubt in certain cases of incipient meningitis this is sufficient, but in purulent meningitis it merely delays the fatal issue a few hours or days.

To drain the pia-arachnoid cavity the dura may be dealt with in several ways: (1) By excising narrow strips in parallel rows; (2) by raising as large a flap as the bone-wound permits of; and (3) by removing entirely the dura corresponding to the bone wound.

Whether decompression be performed over the temporo-sphenoidal or cerebellar area, great difficulty is encountered in dealing with the brain substance itself. The moment the dura has been incised, the cerebral or cerebellar cortex, as the case may be, is thrust into the wound by the *vis à tergo*, and tends not only to cork up the opening made and so prevent the escape of infected cerebro-spinal fluid, but also to lacerate its substance against the edges of the bone wound. Efficient drainage of the subarachnoid space is consequently rendered very difficult. The tendency to brain hernia is also encouraged partly from the *vis à tergo* and partly from the mechanical difficulties of maintaining free drainage. To obviate

this tendency to brain herniation, Haynes, of New York, has suggested drainage of the cisterna magna through the cerebello-medullary angle, as in this situation there is no brain-tissue in the immediate neighbourhood to protrude, and also because infected fluid is prone to collect here. He regards this situation as the *one logical place* where removal of infected cerebro-spinal fluid should be practised. The patient is laid prone upon the operating-table, the head being held up by a suitable head-rest or by a competent assistant. An incision is made in the middle line from the occipital protuberance to the spinous process of the axis, the soft parts retracted, and the underlying occipital bone removed. A $\frac{3}{4}$ in. trephine is applied in the middle line about 1 in. above the margin of the foramen magnum and a disc of bone removed. The dura is then separated from the bone and two grooves made through the bone into the foramen magnum. When this triangular piece of bone has been removed, the dura presents under pressure. A small incision is made through the bulging dura and arachnoid, with the immediate escape of cerebro-spinal fluid. When a quantity of fluid has drained away, the incision is enlarged and an inspection made of the posterior poles of the cerebellum, the notch between them, and the posterior surface of the medulla. A drain is then inserted into the cisterna magna and suitable dressings applied. So far I have only performed Haynes' operation twice, and in neither case did the patient survive. In both cases, I believe, the operation was undertaken too late. The procedure, however, appeals to me, and at some future date I hope to have success with a case undertaken at a much earlier stage of the disease. The position of the patient upon the operating table rather interferes with the administration of a general anæsthetic.

My records show thirty-seven cases of meningitis serosa so called, with twenty-nine recoveries and eight fatal cases. In these eight cases the cerebro-spinal fluid became definitely purulent, and although one or other form of decompression operation was performed, it was unsuccessful. Of cases diagnosed at the time of admission to hospital or to surgical home to be suffering from purulent meningitis and submitted to operation, I have had fourteen. In four of these cases it probably would have been wiser to have attempted no operation; at any rate, all died. Of the remaining ten, where there was at least a sporting chance of recovery, six died, and four, or 40 per cent., recovered. This certainly is nothing to boast of, but is, at least, a step in the right direction.

The PRESIDENT (Dr. J. DUNDAS GRANT) said it was gratifying to notice the hopeful tone which Dr. Milligan had adopted towards the disease, in which he agreed with what had been expressed by Kopetzky and others in recent discussions. At the commencement of the year a long discussion on the subject took place at the German Otological Society, and there it was said that the best results followed incision of the dura matter. Alexander recently brought forward cases in which that was the determining factor. He hoped that, in his reply, Dr. Milligan would formulate what indications as given by the biochemical tests would not only justify but call for immediate operation of a complete kind. The Germans recognised the possibility of spontaneous recovery from meningitis. Though that did occasionally take place, it was not to be counted upon. He would be glad to know whether Dr. Milligan's study of the new methods had led him to know when the danger-point was within threatening distance. In various diseases undoubtedly the best results were obtained from early recognition and operation; and even where there seemed to be a distant

chance of spontaneous recovery, it was better that a few more operations should be performed, if done skilfully, than that an additional life should be lost owing to their omission.

Mr. C. E. WEST said he disliked the term "meningitis serosa." There was only one infective meningitis, and the phase of it depended on the period of invasion, on the infectivity of the micro-organisms, and upon the resistance of the patient. Meningitis serosa, plastic meningitis, exudative meningitis, etc., were terms of *post-mortem* room description, and had little to do with diagnosis or treatment. In the matter of prognosis one must distinguish between early and late meningitis, but in every case of meningitis the cerebro-spinal fluid had certain common characters, and one could not draw lines of distinction. Even with regard to acidity the reaction depended on the sensitiveness of the indicator—*i. e.* as to whether one called it acid or alkaline. Lumbar puncture remained the great means of diagnosis, and he regarded all neurological reactions as of relatively academic interest only. The phrase "acidosis" was interesting with regard to the cerebrospinal fluid. The causal organisms of meningitis, particularly the streptococci, grown on any medium which contained glucose, all produced an acid reaction, and he felt that the organisms were growing in a culture medium inside the patient's head, and the acid reactions were produced as in broth. Another phrase which he would like to see deleted was "pachymeningitis externa." Why should that be called meningitis at all? If one used the term "extra-dural abscess" the meaning would be clear. When there was an abscess outside the peritoneum one did not speak of peritonitis. There was, of course, "ulceration of the dura mater," but the term was dangerous in the sense that it was consecrated to the idea of transdural infection, which was one of the rarest ways in which meningitis occurred. In many cases of meningitis the route was easily provable. In relation to this he related a case; it was that of a girl, aged thirteen, who obviously had meningitis and a chronic discharge from both her ears. He eventually selected one ear as being the more likely. She had a foul condition in her mastoid, and there was an abscess in the posterior cranial fossa and "ulceration" of the dura mater; it was granulating, but the sinus was not thrombosed. He found no pus inside the labyrinth nor any evidence of infection, except that he raked out some reddish thickened shreds. When the internal auditory meatus was opened, pus issued from it. When that had ceased flowing he passed the probe along the internal meatus and an adhesion gave way somewhere; he definitely felt he had passed through a resistance, and then there was a fountain of turbid fluid containing flakes of lymph. That brought him to treatment. His cases did not show anything like the brilliant results which Dr. Milligan's did; he did not think that at St. Bartholomew's Hospital they saw the cases so early. Most of the cases were purulent meningitis, as Dr. Milligan would group them. But even in cases of so-called purulent meningitis recovery without drainage or a decompression operation was possible. Other cases, even when purulent, would get well from repeated lumbar puncture, with the injection intra-venously of salines and other measures. Thus it was necessary to preserve one's perspective as to the values of measures employed. He had tried the decompression operation with incision of the dura mater, and his experience was that one had a very encouraging flow of fluid at the moment, but whatever one did, the brain came into the opening in the dura mater, and in twenty-four hours, even with gauze drains, the brain was soldered down to the margin of the drain, and but little drainage was subsequently

procured from that opening. And there would probably be left a hernia of the brain which might give trouble later. Haynes' operation seemed less likely to be followed by herniation of the brain. He recommended particularly drainage by the internal auditory meatus. In using that, one was following the route of infection, and in the case of obstruction a probe could be passed down as often as necessary without risk of injuring brain-tissue. Drainage by that means could be kept up for seven or eight days, and at little expense of the patient's vitality through the extension of the operation, for it must be remembered that these patients were exceedingly ill. That was the great objection to the anatomically good operation which had been depicted on the screen, for every ten minutes spent on the operation narrowed the chances of recovery. If it was simply a question of draining the infected labyrinth, to prevent or minimise the further invasion of the meninges from the labyrinth, simple opening of the labyrinth below the facial nerve by what was called inferior vestibulotomy was, in his opinion, adequate. He regarded complete labyrinthectomy as unnecessarily severe.

Mr. SYDNEY SCOTT would like to add the word "subdural" to Mr. West's list of unsuitable terms. The path of evolution of treatment of meningitis seemed to have followed that of infective peritonitis. This was, of course, chiefly a question of early diagnosis. Often in earlier times when the diagnosis of infective peritonitis was made, the patient was *in extremis* when operated upon. A free incision was made, the intestines were drawn out on to the table, washed and sponged, and the peritoneal cavity flushed out in a very painstaking and thorough manner, but with the inevitable result, that if he survived the procedure at the time it was only to succumb soon afterwards. As the early diagnosis of infective peritonitis became more accurate, so the operations necessary for its relief became less severe. He believed it would prove to be the same with the meninges, which could cope with certain degrees of infection, just as the peritoneum can. Of his own cases of leptomeningitis, those in which he had performed extensive decompression operations with drainage of the ponto-cerebellar recess and basal cisternæ had all been fatal; whereas the successful cases were those in which (a) translabyrinthine drainage had been performed (in cases of meningitis secondary to labyrinthine infection); (b) while in cases of meningitis not due to labyrinthine infection, simple lumbar puncture combined with the mastoid operation had succeeded. He felt sure that the simpler measures which Dr. Milligan had described would be the rule in the future.

Dr. DAN MCKENZIE emphasised the diagnostic importance of pain—occipital headache associated with some rigidity of the neck. In early meningitis one could elicit early rigidity of neck muscles. Occipital headache, whether combined with this rigidity or not, should lead to lumbar puncture and examination of the fluid. The oftener lumbar puncture was performed in such a case the better for the patient. There were cases in which examination of the fluid was negative and yet meningitis was present. In those cases, particularly, the early signs of rigidity were important. But the problem which would demand attention in the future was that of general purulent meningitis and its treatment—namely, that condition in which the disease had passed the incipient stage. Dr. Milligan had described the decompressive and other large operations for desperate cases. With regard to the occipital operation he had described, there had been six cases so far in which it had been done, and without a success; the original author's own cases were all fatal, though in one there was a lightening of the symptoms immediately after

the operation. So one could not, at present, expect much from it. Some theoretical difficulties arose in considering the question of these and other large decompressive operations. Most speakers laid much stress on the mechanical effects on the brain of the pathological process, but one must also consider the toxic effects of the bacterial products on the nerve-cells, and that while it was right to try to obviate the mechanical disabilities, one had also to deal with the vital difficulties just mentioned. Stoddart Barr, of Glasgow, proposed and carried out—though in the particular case not successfully—a washing through of the cerebro-spinal fluid from the brain to the spine by means of some chemical solution. Another possibility was that, instead of having one large decompressive operation, or one large area drained, one should institute a series of multiple drainage points, which would at once secure more efficient drainage and reduce the liability to hernia. With regard to the parallelism between meningitis and peritonitis, in the worst cases of peritonitis multiple drainage had been carried out, and similarly he would favour multiple trephining and multiple drainage in the region of the base of the cranium in severe general purulent meningitis.

The PRESIDENT asked Dr. Milligan to formulate the signs calling for operation; no doubt he would agree that the tests of the cerebro-spinal fluid should be taken along with the clinical symptoms, that one sign should not be taken alone. He would be interested in knowing, also, whether Dr. Milligan found, with the Germans, that cases of staphylococcal meningitis were exceptionally favourable. With regard to Kernig's sign, a prominent neurologist had recently stated that their difficulties would have been less if that "sign" had never been discovered.

Dr. MILLIGAN said, in reply, that what he specially wished to formulate was that serous meningitis was only part and parcel of a general advancing disease; and he agreed with Mr. West that it would be much better not to use the term. But it was a great responsibility for one to try to delete a term altogether, even if one did not believe in its exactitude. It would be better to regard the disease as simply a general infective process, at a certain stage of which there was a watery exudation, which ultimately became purulent. The so-called serous condition he believed to be purely the result of an effort of Nature to protect the individual. The more acute the invasion, the more fluid was thrown out for protection. Mr. Scott had referred to the severity of some of the operations, but they were carried out only in the most desperate type of case. The object should be to deal with the cases before they became so desperate. When they were desperate a mere lumbar puncture was useless. He believed the chemical changes were distinctly in advance of the clinical signs and symptoms, and that examination of the cerebro-spinal fluid was the keystone to the situation. If the carbohydrates had been used up—*i. e.* if there was failure to reduce the copper in Fehling's solution—it showed that pathological changes due to pyogenic infection were going on in the fluid. Diminishing alkalinity—not necessarily an acidity—was the sign that something pathological was in progress. If something radical was not done, meningitis purulenta would supervene. The clinical signs and symptoms took some time to appear. Rigidity of the back of the neck did not occur very early, and though it was easily detected in posterior fossa meningitis, it was not so in middle fossa meningitis. In answer to Mr. West, his present results were better than previous ones. Not many years ago there were 100 per cent. of deaths, and he believed the present mortality rate would be considerably reduced if all the points mentioned were taken into account, and the proper type

of operation instituted. His own objection to translabyrinthine drainage was the fear of infecting the meninges, and where the translabyrinthine operation would do good so also would a small decompression operation. Mr. Scott's comparison of meningitis with peritonitis was a happy one, and it was true that operations for peritonitis were becoming less severe. But why? Only because the disease was now recognised and operated upon much earlier, and the same thing would happen in purulent meningitis. He agreed that spontaneous recovery occurred in certain cases, but that depended on the degree of virulence of the organism. It was not, however, his experience at hospital, where cases were generally brought in late. He had not seen a case of staphylococcal or streptococcal meningitis recover without some operation being done. Pneumococcal meningitis seemed to recover spontaneously sometimes. The operation of tapping the lumbar theca and washing through was a very old suggestion, and had now been given up, as had also the injection of various fluids, among them a preparation of silver.

Dr. DAX MCKENZIE asked, further, whether, in a case of suppurative disease in the ear, in which other signs of meningitis were absent, but in which the cerebro-spinal fluid was found by chemical test to be deficient in carbohydrate and acid in reaction, Dr. Milligan would advise immediate drainage of the subarachnoid spaces.

Dr. MILLIGAN replied that if he had a case of chronic suppurative middle or internal ear disease, with the temperature going up and arterial tension increasing, with diminishing alkalinity of the cerebro-spinal fluid and absence of copper reduction on boiling with Fehling's solution, he would recommend a decompression operation, because such a case was obviously tending towards purulency, and one was justified in operating at once to prevent it.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

December 6, 1912.

MR. HERBERT TILLEY, *President of the Section, in the Chair.*

Abridged Report.

A Belated Sequel to Thyrotomy.—Herbert Tilley, F.R.C.S.—Dyspnoea and stridor caused by inflammation of the larynx, set up by suppuration around a necrosed portion of the cricoid cartilage. Fifteen years previously the patient had been successfully operated upon by Sir Felix Semon for epithelioma involving the anterior region of both vocal cords. The patient, aged seventy-three, consulted me two months ago. Stridor was well marked, especially after exertion or coughing. Laryngoscopy revealed a very narrow glottic aperture surrounded by intensely congested cicatricial tissue. Pressure over front of larynx produced pain. Below the right edge of the glottis a pale granulation could be seen. On November 20 I opened the trachea and inserted a tube, and split the larynx. A foetid slough was seen on the inner aspect of the cricoid, and on curetting it the piece of necrosed cartilage (exhibited) was removed. Recovery has been rapid and uneventful. The exhibitor believes that such a sequel is unique.

Sir FELIX SEMON said there was nothing special about the original malady of the patient, who was then aged fifty-eight, and had malignant disease on the anterior parts of both vocal cords. He performed thyrotomy and curetted the parts, and there was an uneventful recovery. The sequel to the thyrotomy, in his experience, certainly was unique. The case taught that, even at very late periods, swelling within the larynx after such operations did not necessarily represent a recurrence of the original disease. With regard to early after-events, a fact to which he had repeatedly drawn attention was that, if in the scar of a thyrotomy wound a new little tumour made its appearance, one should not at once rush to the conclusion that it must be a recurrence of the original disease. On the contrary, it was only a granulomatous tumour, and if that tumour were removed by forceps from within, it disappeared entirely. It might reappear, but after another removal there was hardly ever a further recurrence. The seat of such granulomatous tumour was either in the scar itself of the former growth, or the anterior commissure of the vocal cords, due to the suture of the thyroid cartilage after the operation.

Dr. DUNDAS GRANT said he had had a similar experience to that which Sir Felix Semon described, and it was disconcerting unless one bore in mind that it was not unusual for granulations to form on the re-entrant angles of the thyroid, and speedily disappear under the applications of chloride of zinc.

The PRESIDENT in reply, said that in thyrotomy for malignant disease, he preferred a small stitch outside and over the front of the thyroid cartilage. In his earlier experiences he had had anxiety on account of the granulations which formed round the stitch when this passed through the cartilage of the thyroid, and had been disappointed when the patient came back at the end of two or three months with a papillomatous mass in the anterior commissure, which he feared might be a recurrence. Therefore he now preferred to stitch the perichondrium and the soft tissues at the sides of the thyroid cartilage and draw them just tight enough to keep the thyroid cartilages fixed for a few days until they were secured by the natural exudation.

Very large Tonsil in an Elderly Patient reduced almost to Complete Disappearance by Galvano-puncture.—Herbert Tilley, F.R.C.S.—Male, aged sixty eight, consulted me for "an accumulation of matter in the nose," which he felt he could not get rid of; "increasing deafness in the left ear for past few weeks," and alteration in the voice. These symptoms had developed during the past six months. The left tonsil was so swollen that it almost touched the right fauces, and extended downwards beyond direct vision below the level of the epiglottis. It was not inflamed nor ulcerated. No enlarged cervical glands. I punctured it deeply in three places with the galvano-cautery. Three weeks later an extraordinary reduction in size was noticed. Similar treatment has been applied on three or four occasions since then, and, with the exception of the lower pole of the tonsil, the gland has almost entirely disappeared. The marked deafness in the left ear has also almost vanished, so that it is now his better ear. The galvano-cautery appeared to initiate a rapid absorptive effect on the tonsil, rather actually to destroy its tissue and replace it by a smaller fibrous mass. Mr. Tilley added that in these days, when no enlarged tonsil seemed safe from surgical interference, he thought it was well to exhibit a type of case in which it was possible to obtain almost total abolition of the symptoms by measures simpler than radical surgical procedures. He had not cauterised the tonsil through its

lowest pole. The patient was now quite comfortable, and he proposed to rest content. A fortnight after making the first three punctures that part of the tonsil which had been cauterised had almost entirely disappeared.

Dr. DE HAVILLAND HALL occasionally used the galvano-cautery for enlarged tonsils. He mentioned, in one case particularly, that of a fat, flabby lady, aged forty, the anæmic type of patient who looked bluish. She had huge tonsils. The treatment occupied six weeks, and resulted in great diminution in the size of the tonsils. She had another course a year after. Five years later there was no vestige of tonsil visible. It was for patients who were getting on in years, and in whom there was a liability to serious hæmorrhage, that the cautery was a great advantage.

Dr. KELSON said the case was of great interest, as it illustrated something in physiology which was often overlooked—namely, the power possessed by the galvano-cautery to cause absorption. In hypertrophic rhinitis, when the galvano-cautery was applied, a great deal more room was often produced than could be expected from either the slough separating or from cicatricial contraction.

Dr. WATSON-WILLIAMS pointed out that the benefit of the cautery was probably due largely to its action on invading micro-organisms: (*a*) directly, when it was probably much the same as the ancient form of applying burning irons to wounds as an antiseptic; and (*b*) from the indirect effect of the inflammatory reaction set up. He took it that the condition in the patient shown was a subacute one, in a not very fibrous tonsil. In patients in whom the usual operation was contra-indicated, cauterising was very efficient.

Dr. FITZGERALD POWELL said that no doubt most of the members had treated of the tonsils with the surface galvano-cautery. It was a tedious, painful process, and required a number of sittings. In this case galvano-puncture had been used with great success, and it was a very useful method of treatment.

Dr. PEGLER said the operation was not very uncommon some years ago, and he believed that the reason it was given up was because of the pain it occasioned.

Dr. DUNDAS GRANT asked whether the tonsil looked fibrous, or soft, and whether there was any other treatment. He presumed the cautery was pushed deeply into the tonsil, away from the mouths of the lacunæ, because one objection to the cautery was its tendency to seal up the mouths of these tubes. He had been deterred from using the cautery because neurasthenic people who had been submitted to cauterisation had afterwards persistent neuralgic pain at the site.

Sir FELIX SEMON said, if he were still in practice, he would still use the galvano-cautery for suitable cases of enlarged tonsils, particularly in adults with hard tonsils, which it was necessary to reduce, and in whom the tonsillotome was not to be recommended. The pain of the operation itself was minimal, after previous cocaineisation, and if afterwards orthoform or anæsthesin was insufflated, the after-pain was much reduced, even in neurasthenic patients.

Dr. IRWIN MOORE had formerly often used galvano-puncture, and was satisfied with the result. He did not think he had had one case of pain or any inflammatory reaction. The patient could be cocaineised in the consulting room, and come once a week for five or six weeks. He had used it satisfactorily for children from eight years of age upwards.

Dr. DAN MCKENZIE said that notwithstanding the furore raging around the tonsillotome, one could not recommend it in such a case as this.

for there was a class of case in which the galvano-cautery was the proper treatment for the reduction of tonsils.

The **PRESIDENT**, in reply, said that the galvano-puncture caused no pain, and the patient seemed willing for him to make as many punctures as he wished, but on no occasion did he make more than three. The tissue was glandular, soft, and not inflamed. He would not use the cautery if the tonsil were fibrous, because it might cause the locking up of septic accumulations. After the third sitting—after great diminution had already taken place—he gave the patient some arsenic and nuxvomica. He used a fine long cautery point, and passed it deeply into the middle of the most prominent portions of the tonsil.

Epithelioma of Left Vocal Cord.—**Herbert Tilley, F.R.C.S.**—Male, aged forty-two, applied to hospital for hoarseness of twelve months' duration. He has always been healthy and there is no history of any constitutional disease. The left ventricular band and cord are replaced by an uneven, granular swelling. There is some movement of the cord and the arytaenoid moves freely. Wassermann test negative. No physical signs of tubercle in the lungs.

January 9, 1913: This patient has been operated upon; the growth was a squamous-celled epithelioma.

Extensive Syphilitic Necrosis of Bones in Relation to the Nasal Cavities.—**C. W. M. Hope, F.R.C.S.**—Female, aged forty-seven, attended hospital for the first time in September, 1911, complained of nasal discharge and slight ozæna. Past history: Injury to nose twenty years ago. Diagnosis of gummatous rhinitis made, and patient put on a mixture of potassium iodide 5 gr. (increasing to 15 gr.) and inunctions of ung. hydrarg. By November 7, 1911, septum had necrosed away. Patient continued treatment regularly until December, 1911. June 14, 1912: Returned with shocking ozæna, very marked nasal depression, and nose filled with pus, crusts, and sequestra. Several sequestra were removed by means of Luc's forceps. June 21: More sequestra removed. Wassermann reaction positive: nose still foul-smelling. On cleaning out nose, both nasal bones were found absent, both maxillary antra almost completely laid open into the nose, and a tooth found protruding into the floor and removed by the nasal route (right lateral incisor). July 6, 1912, 0.55 grm. of salvarsan was given intra-venously, and again on July 12, 1912: by Dr. Emery. The nose at once began to clean up, ozæna rapidly disappeared, and the nose now is clean. The sequestra proved to be the two nasal bones, nasal processes of superior maxillæ, and anterior halves of palatal processes of same bones.

Dr. DUNDAS GRANT said he brought before the Laryngological Society a similar case in which no improvement took place until injections of calomel were given into the muscle, the patient being at the same time highly fed with cream and stout. She went on very well, but a year later she died of nephritis. If he were to have a similar case now, he would use salvarsan followed by mercury.

Mr. PARKER said he had a man under treatment for tertiary syphilis, whose nose at first was packed with offensive crusts. After the first injection of salvarsan these crusts had disappeared, and there had been no recurrence, although the Wassermann test remained positive after four injections.

Mr. WESTMACOTT spoke of a case in which the sequestra were removed on successive visits, but after the patient had been on 20 gr. of potassium

iodide three times a day, they cleared up in a remarkable way. No mercury or other form of treatment was given. He recently had a case in which necrosis of the ethmoid region had broken through the wall into the orbit and produced some proptosis. The Wassermann test was positive. Here, again, he had removed two or three large sequestra, and 20 gr. of potassium iodide had given great benefit. As regards the eye, the proptosis had disappeared. He regarded it as essential to give at least 20 to 30 gr. thrice daily—smaller doses did not seem to give relief.

Dr. PEGLER noted that the report stated the nose to be clean, but he found that purulent material was pouring out of the right antrum, and the left one was far from clean.

A Case of Branchial Fistula.—G. H. L. Whale, F.R.C.S. Male, aged twenty-nine. There is a small sinus over the right ala of the thyroid cartilage. A small probe passes upwards $\frac{1}{2}$ in. only. The sinus weeps during and after meals. The discharge is too viscid for saliva; it retains its alkalinity indefinitely, and does not convert starch into sugar. This is, therefore, presumably a blind external branchial fistula, although the opening is not quite in the usual place.

Dr. DUNDAS GRANT regarded it as an aberrant thyro-lingual duct, although the opening was at some distance from the normal position; with the fingers he could trace it to the hyoid bone. A careful operation might get it well. A fine probe must be passed up until it got to the hyoid bone, and it should be uncovered as far as possible by dissection, and through the tube a fine electric needle (electrolytic or galvanocautic) could be passed. In two cases in which he did this there was no recurrence.

Dr. FITZGERALD POWELL was of opinion that this was a sinus remaining from a cyst in connection with a branchial cleft which had been opened in early youth. At the bottom of the sinus would be found a distended portion, from which secretion arose. He had dissected these out, and found no great difficulty in doing so. He could not agree that it was a sinus in connection with the thyro-lingual duct: it was well away from the middle line.

Mr. WILKINSON did not see why it should not be a branchial fistula derived from the fourth branchial cleft. The inner opening of such a cleft would be situated in the pyriform fossa. An operation for dissecting it out might prove a serious undertaking owing to the close relations of the sinus with the carotid and other structures in the neck.

The PRESIDENT considered it to be a branchial cleft. In a family of eight whom he knew, four had these branchial clefts and one had auricular appendages. An extensive dissection was often necessary for the cure of these clefts, for sometimes they went deeply towards the side of the pharynx and the base of the tongue.

Lingual Thyroid Operation.—W. G. Howarth, F.R.C.S.—The patient complained of difficulty in swallowing with occasional attacks of dyspnœa. The tumour involved the base of the tongue. The thyroid in the neck was scarcely palpable, but at the time of operation, when a preliminary laryngotomy was performed, both lateral lobes were found to be present, though no trace of the isthmus could be detected. The section shows a fibrous capsule outside a layer of thyroid glandular tissue; the centre of the tumour is made up of blood-clot.

Fibroma from the Soft Palate.—**W. G. Howarth, —F.R.C.S.**—This occurred in a patient who had a papilloma of the uvula removed six months ago. The section shows fibrous tissue in every stage of development. Six months ago he had removed a papilloma from the uvula and put in a catgut stitch. It had been suggested that the present tumour had been caused by the irritation of the stitch, and he would be glad to hear the experience of others.

The **PRESIDENT** remarked that at one of the meetings of the old Laryngological Society a member remarked that tumours of the soft palate were very rare; but during succeeding meetings of the Society several cases were shown. Mr. Stephen Paget showed a case of fibroma of the soft palate, and other members also exhibited cases of non-malignant tumours of the soft palate.

Healed Lupus of the Pharynx and Larynx.—**W. G. Howarth, F.R.C.S.**—This case was shown in March, 1912.¹ The condition was then extremely active, the pharynx and larynx being ulcerated and swollen. Nothing in the way of local treatment had been used. Such cases have a tendency to heal spontaneously. He had taken care that the patient was in the best hygienic condition, and he gave her cod-liver oil and milk, but no local treatment and no drugs.

Dr. FITZGERALD POWELL had had a girl whose larynx, pharynx and nose were in a similar condition, and had cleared up completely under arsenic.

Dr. LOGAN TURNER asked if members had had experience in connection with the treatment of lupus by Pfannensteil's method—namely, using nascent iodine and ozone or hydrogen peroxide. He had treated several cases in that way, and was so far pleased with the results. The patient was put upon sodium iodide, and pledgets of sterilized gauze soaked in hydrogen peroxide were placed in the nasal cavities. Cases which had been treated by curetting and scraping without success responded very well to this method.

Mr. HUNTER TOD said that Pfannensteil's method had been used in the London Hospital for some time, but the results had not been very successful. It had been beneficial in some of the mild cases, but the chief difficulty was to make the patients continue with the treatment as it was so disagreeable. With regard to curetting the nose, whatever might be the opinion of others, he himself was certain that it was by far the best treatment. It was interesting to note that those in charge of the Lupus Department at the London Hospital refused to treat cases of lupus of the face unless the nose had been examined, because until the lupus within the nose had been removed by curetting, although a temporary cure of the lupus of the face might be obtained by the Finsen light treatment, a recurrence usually took place. On the other hand, if the nose was thoroughly curetted, not only was a more rapid and better result obtained by the light treatment, but it was usually permanent. Mr. Tod's method of curetting the nose was by means of the ring knife. He did not claim immediate cure, but if recurrence took place, the part could again be curetted. The emphatic opinion of those in charge of the Lupus Department at the London Hospital was that, although arsenic might be beneficial, and might improve the condition of health, its use, or applications of lactic acid, carbolic acid, the cautery, and other out-of-date methods of

¹ JOURN. OF LARYNGOL., RHINOL., AND OTOL., vol. xxvii, p. 328.

treatment were of no value. They pinned their faith absolutely to free-curettage, and this had been definitely proved by the results.

Sir STCLAIR THOMSON thought sufficient stress had not been laid on the fact that this case had got quite well without any local or general treatment. He had emphasised this point at more than one of the meetings. A drawing of one such case was given in his book—a very extensive case of lupus in the larynx in a girl who had nothing done to the larynx, and whose lesion had remained cicatrised for eight years. In view of what he had said, one should be modest in ascribing successes with lupus to any particular treatment, and under those treatments he included arsenic. Many cases of lupus which got well broke down again.

Dr. D. R. PATERSON said that in two cases he tried the method mentioned by Mr. Logan Turner, and had good results. He kept the gauze constantly soaked with the peroxide of hydrogen, and gave sodium iodide internally. He treated one of the cases months ago, and six months later there was no recurrence.

Dr. DAN MCKENZIE said that Pfannenstiel's process was tedious and difficult to apply; it made the patient uncomfortable; and it was necessary for the application of the peroxide to be constant so as to get the full effect of the nascent iodine. In the cases in which he had applied it, the patients had been very persistent and conscientious, yet the results after the first few weeks were not good, the condition seemed to slip back, so that the net result of the treatment was practically *nil*.

Dr. H. J. DAVIS had had an unfortunate experience with hydrogen peroxide. He had ordered applications of peroxide of hydrogen in a case of lupus of the palate, and the palate gave way and caused the patient considerable suffering. He left it alone for a time, and the palate healed. Later she used it again with the same result—the strength of the peroxide was 10 vols.

Mr. HOWARTH, in reply, said that he did not give the patient any arsenic.

Kuhn's Per-oral Intubation Apparatus.—W. G. Howarth, F.R.C.S.—This apparatus is useful for operations at the back of the throat or nose where bleeding is very severe, as by its use the necessity for a preliminary laryngotomy is obviated. He had used the instrument for eighteen months with considerable satisfaction. In many cases he did not now do preliminary laryngotomy, but used these tubes. He did so in the palate case he showed that day, and in such cases as sarcomata of the tonsil and post-nasal space.

The PRESIDENT asked if blood did not sometimes pass beyond the vocal cords into the trachea, for he had heard it stated that the instrument did not completely occlude the glottis.

Sir FELIX SEMON had seen the tubes repeatedly used in Professor Killian's clinic in cases of operations on the upper air passages, and there had been no escape of blood into the lower air-passages, even when there was much bleeding at the time of the operation.

Tuberculous Abscess in the Post-nasal Space.—G. W. Badgerow, F.R.C.S.C.Ed.—A male, aged twenty-five, came to the hospital complaining of deafness. On examination of the post-nasal space a small rounded swelling was noticed: it was soft and fluctuating to the feel. The patient had no difficulty in breathing, nor is the voice altered. On

raising the palate the swelling could be made to protrude. Operation showed the swelling to be a cold abscess in connection with the vertebrae, with erosion of the bone.

Meningocele in the Naso-pharynx.—H. A. Kisch, F.R.C.S.—The infant, aged six months, was brought to the hospital on account of difficulty in breathing through the nose. There is a cystic tumour in the naso-pharynx, pushing forward the soft palate. The tumour is situated in the mid-line. It is apparently attached to the anterior surface of the spine. There is no evidence of nerve involvement or other abnormality.

Foreign Body extracted from the Œsophagus.—C. W. M. Hope, F.R.C.S.—The fin of the haddock was removed from the patient by the direct method. Ten days after its lodgment the position occupied by it was 4 in. below the cricoid. It had given no inconvenience beyond slight difficulty in swallowing solids.

Foreign Body removed from the Upper Part of the Œsophagus.—D. R. Patterson, M.D.—The foreign body, a chicken-bone, $1\frac{1}{4}$ in. long, was taken from a young Chinaman, who presented himself at the hospital with almost complete œsophageal obstruction and pains in the upper part of the gullet of forty-eight hours' duration, which had come on after eating some chicken. With the œsophageal tube the upper end of the bone was exposed just below the cricoid orifice. It was easily removed. Both its ends are sharp. The specimen is shown to illustrate the danger of attempting to push down such a body with a bougie.

Dr. BROWN-KELLY, for removal of sharp foreign bodies impacted in the upper part of the œsophagus, recommended Hill's dilatation speculum. One branch could be placed in front and the other behind the foreign body, which usually lay with its long diameter transversely.

The PRESIDENT described a case in which a halfpenny had lodged just below the cricoid region of the gullet for five days. On direct examination the coin was seen lying in an ulcerated area and surrounded by œdematous granulations. It was removed with little difficulty, but the child died the same night. At the *post-mortem* the œsophagus was found to be ulcerated right through into the trachea and that had occurred in five days.

Dr. DAN MCKENZIE said it was nowadays common to hear of foreign bodies removed from the air-passages, and one wondered what happened to those cases before the introduction of long tubes. Did the patients invariably die or become the victims of serious disease? There must be some foreign bodies which caused but a trivial disturbance.

The PRESIDENT remarked that many of these unsuspected cases suffered from bronchiectasis and were regarded as such. In one case of bronchiectasis which had been referred to him, the foreign body had been retained for three and a half years. Possibly some hitherto obscure cases of septic pneumonia were due to impacted foreign bodies.

A New Telescopic Œsophageal Tube.—D. R. Paterson, M.D.—The exhibitor has constantly used this tube for the last three years. A disadvantage of the ordinary bevel-ended outer tube is that when working in the upper part of the œsophagus its point travels in front of the line of vision, and, further, exposes only one side of the canal to view. On the other hand, a straight-ended tube, as it passes down, opens out the

whole circumference of the oesophageal wall simultaneously. The instrument shown has a bevel-ended inner tube, which, acting as a pilot, is easy of introduction. Once past the cricoid opening it is withdrawn, leaving the straight-ended outer tube to continue the examination. The latter, being wider, gives, moreover, greater room for manipulative measures.

Dr. DUNDAS GRANT said the tube was an improvement. It acted like a mandrin, but permitted of inspection during its progress.

Hyperostosis Cranii.—Edward D. Davis, F.R.C.S.—The patient complained of deafness of gradual onset. The swelling of the right cheek was noticed about twenty years ago, and eighteen years ago (1894) an osteoma was removed from the infra-orbital margin and the facial wall of the antrum. The denture now worn was made eleven years ago, and the fact that the plate is $\frac{1}{4}$ in. from the teeth gives a rough estimate of the rate of growth of the palatal swelling. No family history. Present condition: a woman, aged forty-three, with an osseous and uniform swelling of the palatal process and facial surface of the right maxilla or the mastoid process. Both antra are opaque to transillumination. The right external auditory meatus shows exostoses. No other exostoses can be found. Wassermann reaction negative.

Mr. WILKINSON said there was a form of very slow-growing osteosarcoma of the antrum in which the cell elements were scanty. He had had one such tumour in a young female child, in which he removed the upper jaw. There had been no recurrence, but he had rather regretted having done so extensive an operation, attended as it was by serious deformity, where a less radical procedure might have sufficed.

Dr. PEGLER remarked that this case had not received the more familiar title of leontiasis ossium.

Bullet Injury to the Larynx.—H. J. Davis, M.B.—The patient, a man, aged twenty-two, was shot through the larynx. The bullet, a Mauser, passed out on the left side of the neck. The vocal cords were evidently shot away, for on taking a deep inspiration the aperture of the glottis is circular, the apex of the anterior attachment of the true cords being replaced by a band of fibrous tissue, which stretches on deep respiration like a piece of elastic. The patient phonated with the ventricular bands.

Paresis of the Left Recurrent Laryngeal Nerve.—H. J. Davis, M.B.—The patient, a woman, aged thirty-five, has an enlarged thyroid gland of which she complains. The voice is unaffected, although the left recurrent laryngeal is partially paralysed. Left abductor paresis.

Mr. NORMAN PATTERSON saw the case some time ago but did not notice any paresis of the left cord. Now there might be slight abductor paresis of both cords, not specially associated with the left.

Papilloma of the Nose.—H. J. Davis, M.B.—Man, aged forty. The entire left nasal cavity was occluded by a papillomatous growth, it was sprouting from septum, vestibule, and inferior meatus. The exhibitor assumed it was malignant, owing, among other things, to its vascularity—but this is not so. Several sections are reported to be "non-malignant papilloma" (by Dr. Elworthy). The growth was curetted—it has not recurred, but, as can be seen, is not completely removed; on the left side of the cavity a few elevations still remain *in situ*.

Foreign Body in Trachea removed by Upper Bronchoscopy.—H. J. Davis, M.B.—The child, aged five, while eating loiled rabbit, had

a choking fit lasting a quarter of an hour; it then stopped. The boy had been unable to swallow anything since. The child kept his head bent to the left with the chin flexed on the chest. An X-ray plate was taken, with negative results. Nevertheless there was a bone there all the same, and it was easily seen with the bronchoscope owing to its ivory colour; it was fixed obliquely in the trachea about 2 in. below the cords, and was removed with the extractor under anæsthesia. This case was anæsthetised by Dr. Phillips by injecting a syringe of ether into the buttock, the child being primarily rendered unconscious by ethyl chloride. This method is a great convenience. Anæsthesia was complete, and I can recommend the method to others.

The case is also of interest as it exemplifies the fact that absence of cough and other respiratory distress by no means excludes the presence of a foreign body in the air-passages. The symptoms in such cases are very severe at first and then quickly disappear, and nothing may attract attention for some days until perhaps a unilateral bronchitis develops—whereas, when foreign bodies lodge and are retained in the œsophagus, patients are in trouble all the time. The foreign body is $\frac{3}{4}$ in. in length, very sharp at both ends, hence its impaction.

The PRESIDENT said instantaneous X-ray photography would reveal a foreign body which would not have been shown by the ordinary method. He remembered a case in which a foreign body was thus overlooked (a very hard and thick chicken-bone), but it was at once detected by the instantaneous method.

Dr. FINZI said both lateral and anterior views should be taken. The instantaneous method should always be carried out in the case of children, otherwise there could not be a cessation of both breathing and swallowing during the exposure.

Dr. DAVIS, in reply, said that a lateral view was also taken. The child was quickly anæsthetised by ethyl chloride, and the injection was made into the muscle of the buttock. The child was heavily asleep three quarters of an hour after the operation.

Extensive Epithelioma of the Larynx after Operation.—P. Watson-Williams, M.D.—Male, aged sixty-five, when first seen in February, 1912, had complained of hoarseness for twelve months. He was very dyspnoeic with some inspiratory and expiratory stridor, due to the obstruction produced by a whitish cauliflower-like neoplasm occupying the whole of the left arytenoid and of the ary-epiglottic fold on its inner aspect, the ventricular band and cord, and extending well below the glottis. It extended to the mid-line anteriorly and posteriorly. Operation (March 4, 1912): After preliminary tracheotomy, thyro-chondrotomy followed by removal of the growth in the usual manner, but the left arytenoid cartilage and the ary-epiglottic fold were cleared away, and the whole of the left thyroid ala, the crico-thyroid membrane and the upper half of the cricoid cartilage on his left side were stripped to the mid-line posteriorly, and a little beyond the mid-line anteriorly, above and corresponding to the vocal cords, and to the mid-line below. Tracheotomy tube removed nine hours after the operation and not replaced. The wound healed by first intention by March 6, except tracheotomy wound, but difficulty was experienced for long with swallowing liquid food, owing to the free removal of the left arytenoid and ary-epiglottic food. The growth was a squamous-celled epithelioma. On July 6 a small reddish patch on the whitish point was noticed on the centre of the cicatrix, and by August 2 the white spot had become a discrete raised outgrowth like half a mustard-

seed. It was removed by forceps, and submitted to Professor Walker Hall, who reported that the sections showed squamous-celled epithelioma.

When last seen in November there was no local appearance of recrudescence. Owing to the very extensive removal of the soft structures on the left side of the larynx there is marked cicatricial contraction, and any further operative interference would involve wearing a tracheotomy tube. It is proposed to dilate the laryngeal stenosis by tubage.

Photographs of Patient after Osleoplastic Frontal Sinus Operation.—**P. Watson-Williams, M.D.**—The patient had suffered from severe supraorbital headaches and pain at the back of the eyes, which prevented her following her occupation. She had double-frontal sinus and double-antral suppuration, and operation on the antra and intra-nasal removal of suppurative ethmoidal cells failed to effect relief. The exhibitor's osteoplastic operation was performed a little more than a year ago. The



Photograph of patient after Dr. Watson-Williams's double radical frontal sinus operation.

frontal sinuses were large and deep for a female, and though completely cured of all headaches, there was a slight central depression in the forehead. She did not complain of the cosmetic defect, but as the left antrum required further attention, the depression was removed by paraffin injection. She is now not only completely cured, but there is practically no trace of the operation, which has left no cosmetic alteration, and no defect.

Sarcoma of the Upper Jaw; Resection of the Left Superior Maxilla and Treatment of Recurrent Growth by Radium.—**P. Watson-Williams, M.D., and N. S. Finzi, M.B.**—The patient, aged sixty-nine, had a swelling on the left side of the hard palate for seven years. The left nasal passage had become somewhat obstructed, and slight fulness noticed externally over left cheek when first seen.

On January 23, 1912, a growth was removed from the antrum, the anterior, inner, and outer walls being removed, but not the roof. The growth had invaded the floor, and there was stripped off the soft tissues of the palate. It was reported to be a round-celled sarcoma of

slow growth. The long history of the palatal swelling seemed to justify the hope that it was of slight malignancy. When seen in September, however, the palate showed an elevated ulcerating growth of the same structure as the original neoplasm. On September 22 the superior maxilla was removed, but the growth had extended into his pterygo-maxillary fossa. It was removed as far as possible, but obviously without success, as it recurred in several places, and marked enlargement of the deep glands of the left side of the neck developed. The patient's urine was loaded with sugar, the glycosuria having arisen during the past few months.

Dr. N. S. Finzi has been treating the patient with radium with some amelioration.

Dr. WATSON-WILLIAMS said the case was shown not as an instance of the efficacy of radium in sarcoma. Nevertheless, the improvement following his radium application was very decided, but the patient was not free of the growth by any means.

Small Round-celled Sarcoma; Partial Removal and Subsequent Treatment by Radium.—P. Watson-Williams, M.D., and N. S. Finzi, M.B.—Female, aged forty. Enlarged gland noticed below angle of right lower jaw in February, 1912. It was diagnosed as possibly tuberculous and was treated with tuberculin, but as it gradually increased and the right tonsil was somewhat enlarged the gland and the tonsil were removed, and the gland was found to be sarcomatous. Patient was averse to any extensive operation, therefore it was decided to treat her with radium. Application of 200 mgrm. radium bromide have been made by Dr. Finzi for thirteen hours in three days; exposures of right tonsil region inside and to the thickened tissues behind and below the angle of the jaw. There is now no evidence of the former growth.

Sarcoma of the Right Superior Maxilla; Removal of Jaw and Subsequent Applications of Radium for Recurrence.—P. Watson-Williams, M.D., and N. S. Finzi, M.B.—Female, aged thirty. First seen July 9, 1912, complaining of dull aching in right cheek. There was smooth rounded fulness over the right maxillary antrum, a smooth swelling of the hard palate on the same side, and the right inferior and middle turbinates were pushed in, partially occluding the nasal passage. The exhibitor's antral exploring syringe was used, the needle passed through the middle meatus, and a small portion of the growth sucked into the needle enabled Professor Walker Hall to report that the antral growth was a large round-celled sarcoma. Operation, July 10: Removal of right upper jaw, the antrum being found filled with growth which had involved the roof, outer wall and floor and extended backwards to the pterygo-maxillary fissure. She recovered without any noteworthy feature. By carrying the infra-orbital incision higher up towards the inner canthus than usual one gets little external deformity, as the zygomaticus major is divided near its upper insertion. Sections showed the growth was a large round-celled sarcoma (osteoid sarcoma). July 25: Portions of recurrent growth reported to be osteoid sarcoma removed from floor of orbit and from alveolar margin. July 31: These areas were operated on afresh, but similar recurrences developed in the orbital floor and in the pterygo-maxillary fissure. She has since then been treated by Dr. N. S. Finzi and appears to have remained free from any evidence of recurrence. Radium bromide, 200 mgrm. used for exposures, with $\frac{1}{2}$ in. platinum filter; (a) August 22 to 28, four exposures; (b) October 14 and 15, exposures lasting twenty-four hours altogether.

Dr. FINZI said that in the last case the radium was applied continuously for ninety-six hours, starting August 23, 1912, forty-eight hours packed in the cavity and the rest of the time on lint externally; the radium employed was 200 m., and the metallic filtration of the rays used was 2 mm. thickness of platinum. She had a second exposure on October 14, lasting altogether twenty-four hours. The first case, that of the old man, had applied to it the same quantity of radium and the same filtration; he had it packed inside the nose for forty hours, outside, over the glands on both sides of the neck; the application lasted altogether two days. A second similar application had just been completed. In this case the radium was applied solely with the idea of affording relief, and it had done so. The second case had an exposure with radium against the tonsil, with the same filtration and the same amount of radium, for four and a half hours; then she had fourteen and a half hours with the radium outside, on lint under the jaw, and another fourteen and a half hours just behind the jaw. There was a severe reaction afterwards, but the tumour had disappeared. Where the growth was in the upper jaw, the round-celled sarcomata were almost invariably benefited by radium. The rapidly growing epitheliomata of this region which recurred rapidly when it was removed surgically also did very well with radium. Some epitheliomata were very refractory; the squamous-celled growth of the mucous membrane as a rule did badly, but he had occasionally had good results there also.

The PRESIDENT said that up to the present it seemed impossible to do anything curative with squamous-celled epitheliomata, especially of the buccal laryngeal or œsophageal mucous membranes.

The Tonsillectome—a New Type of Guillotine or Tonsillotome specially designed for the Enucleation of Tonsils.—J. F. O'Malley, F.R.C.S.—This instrument is intended for enucleation only, and has been gradually evolved to meet the difficulties of enucleation as they arose in the method which I use. I have used this type of instrument for over a year in close on 1000 cases with very satisfactory results. The hæmorrhage is exceptionally slight, being only an average of 3 dr. for both tonsils in a large series of cases. The advantages claimed for the special features of the instrument were described.

Dr. WATSON-WILLIAMS was sure the principle of the instrument shown was the right one to go upon; more than a year ago he had designed a similar instrument, and more recently Professor Ballenger had shown him his original tonsil forceps, which was very much like his own design.

Dr. IRWIN MOORE contratulated Mr. O'Malley on his improvement, but thought the Heath guillotine would be hard to beat.

Tumour of the Right Superior Maxilla.—J. F. O'Malley, F.R.C.S.—F. W.—, aged twenty-six, noticed swelling two months ago. Onset gradual; has steadily increased. No pain or tenderness at any time. No nasal discharge or obstruction. Examination: Hard swelling or anterior aspect of right superior maxilla. It extends upwards to infra-orbital margin, inwards on nasal process and down to alveolus. It does not involve the orbital, palatal, or nasal aspect of the maxilla. There were two questions of interest in this case. The first was to determine whether the antrum was involved or not; and the second, if it was affected, what was the nature of the disease? The absence of pain or tenderness, no nasal discharge, no alteration in the orbital, palatal, or nasal walls of the antrum, no egg-shell crackling, and the negative

results of transillumination and lavage exclude any affection of this cavity. The hardness of the swelling, the absence of pain or tenderness, and of infiltration of the superficial tissues, and no pulsation, point to a benign growth such as an osteoma. The history of two months' growth is, however, rather short for an osteoma of this size.

Mr. WRIGHT said he thought the skin was adherent over it, and it felt very much like a periosteal sarcoma of the malar bone.

Mr. O'MALLEY replied that he examined the case carefully under cocaine and adrenalin. There was some inflammatory reaction to-day round the puncture of the trocar and cannula, and that was the cause of some oozing of a serous exudate which led one of the members to think that the nose was being invaded by an antral growth. There was no trace of bulging on the previous day.

Tuberculous Ulceration of the Pharynx with Involvement of the Larynx.—**Somerville Hastings, M.S.**—Woman, aged twenty-four. Two months ago she began to complain of aching pain in the throat, especially on the left side. A little later the voice became slightly hoarse and a cough developed. The pain in the throat is now more severe, and at times keeps her awake at night. There is some pain in swallowing. The surface of the left tonsil is covered by a rough, nodular growth, ulcerated in places, which has spread to both pillars of the fauces and to the soft palate, and extends downwards as far as the epiglottis. The growth is firm to the touch, but there is no deep induration. The epiglottis is swollen and pale, and so are both arytaenoids. The cords are normal. The uvula is red and cedematous, and a lymphatic gland about the size of a filbert-nut can be felt behind the angle of the jaw. Dr. R. A. Young thinks both lungs are affected by tuberculosis. Wassermann reaction is negative, and a small portion of the growth removed for histological examination shows typical giant-cell systems.

Tumour of Region of the Left Palate.—**Hunter F. Tod, F.R.C.S.**—Male; aged forty, tumour first noticed two weeks ago; painless. Was twice incised by the doctor, who thought it was a quinsy. The post-nasal space is found to be partially blocked owing to the swelling of the soft palate posteriorly.

Swelling and Ulceration of Subglottic Region of the Left Side of the Larynx.—**Hunter F. Tod, F.R.C.S.**—Female, aged twenty-eight. The patient had a large mass on the left side in the subglottic region, and fixation of that side of the larynx. She had been treated for tuberculous trouble of the left knee-joint for three years. Some hoarseness and cough for about one year. No tuberculous disease of lungs. Mr. Tod regarded it as tuberculous, and invited suggestions as to treatment.

Sir FELIX SEMON said he would be afraid to do anything in this case on account of the complete fixation of the crico-arytaenoid articulation. He did not see any immediate necessity to interfere.

Post-nasal Tumour.—**Norman Patterson, F.R.C.S.**—Female, aged forty-eight. Post-nasal growth removed ten years ago. Recurrence: On November 11, 1912, I removed, by means of a snare, a tumour the size of a walnut, from the region of the left Eustachian tube. It was a firm fibrous mass and presented no ulceration. Four years ago gathering in left ear. Watch now heard on contact. Growth appears

clinically to be benign, but pathologists report on last specimen that it is a squamous and polygonal-celled carcinoma. Patient now shows some fulness over the left Eustachian orifice, but there is no ulceration. Opinions as to the nature of the tumour and the treatment to be adopted are invited.

The PRESIDENT said he had seen seven cases of endothelioma of the lateral wall of the naso-pharynx. The cases had all been fatal. They usually produced deafness, with serous effusion in the tympanum, anaesthesia of the third division of the fifth nerve, and mechanical fixation of the levator palati. At first he thought this case was endothelioma, but the history seemed too long for this view to be maintained. Each of his cases recurred in six or seven weeks to two months after operation.

Mr. PATTERSON replied that he had had an endothelioma in a patient aged over fifty. He removed it as far as he could through the soft palate, but it recurred in two or three weeks. There was great pain in the occipital region and a discharge from the ear.

Swelling of the Larynx.—W. H. Kelson, M.D.—Female, aged forty, suffering from swelling of the left arytaenoid, left ventricular band, and adjacent part of pharyngeal wall. Discomfort had come on directly after a meal about a week previously. The left cord did not seem to be affected. No history or indication of tubercle or syphilis could be obtained. The affected parts looked very cedematous. Subsequent history: A week after the exhibition of the case a free discharge of pus took place and the whole swelling subsided.

Dr. WRIGHT said the case looked to him like one of acute perichondritis with abscess, or possibly sub-perichondrial hæmorrhage resulting from the strain of vomiting. The patient had a similar attack a year ago, and she had now got considerable swelling on the left side, apparently fluid, involving the arytaenoid and the false cord region, practically blocking up the whole of that side of the larynx.

PROCEEDINGS OF THE SCOTTISH OTOLOGICAL AND LARYNGOLOGICAL SOCIETY.

Meeting in the Royal Infirmary, Edinburgh, November 30, 1912.

DR. J. S. FRASER *in the Chair.*

Reported by DR. W. S. SYME.

(Continued from p. 164.)

Naso-pharyngeal Fibro-sarcoma; Operation; Recovery.—W. Milligan, M.D.—Patient, F. L.—, male, aged fourteen, was admitted to the Royal Infirmary, Manchester, in September, 1909, complaining of nasal obstruction, marked deafness upon the right side, and progressive loss of weight of twelve months' duration. The naso-pharynx was blocked by a large and hard growth, springing apparently from the junction of the vault with the posterior pharyngeal wall upon the right side. The right nasal passage was completely occluded by a prolongation

of the growth. The right membrana tympani was much retracted and the tympanum contained fluid.

Operation.—A Kuhn's per-oral intubation tube was first passed and the anæsthetic administered through it. The right half of the upper jaw was removed and an excellent view of the growth obtained. The growth was removed by means of an ecraseur, which was very gradually tightened. Its point or surface of origin was scraped with a sharp ring knife, and then cauterised with an electro-cautery needle. Hæmorrhage was not at any time serious.

Up to date the patient has been free from recurrence and his general health is excellent. He now wears an obturator, and is able to talk well. Specimen shown.

Œsophageal Pouch ; Removal ; Recovery.—W. Milligan, M.D.
—A male, aged fifty-six, seen February, 1912, had suffered for two years from difficulty in swallowing and from frequent regurgitation of food, often from an hour to two hours after having swallowed it. There had been considerable loss of weight and strength. Examination with a bougie showed that there was a diverticulum about the level of the cricoid cartilage projecting slightly to the right side. Examined with X rays, bismuth porridge was seen to pass readily into the pouch, a small portion trickling slowly into the stomach (photograph shown).

Operation.—Under general anæsthesia an incision was made along the anterior border of the right sterno-mastoid muscle and the lateral wall of the œsophagus exposed. The bougie, previously passed, was used to make the pouch project and to define its size and attachments. The pouch was then carefully cut away from the œsophagus, and the opening in the œsophageal wall closed with a double row of sutures. Rectal feeding was adopted for four days, after which time the patient was given sterilised milk by the mouth. Rapid improvement followed, and by the end of three weeks the patient was taking ordinary food without any difficulty. There has been no relapse and the patient has gained weight.

Photographs shown illustrating the pouch distended with bismuth porridge. Pouch shown.

Dr. Milligan agreed with Dr. Fraser that these pouches were not really œsophageal but hypo-pharyngeal: they occurred just as the hypopharynx passed into the œsophagus. There is a perfectly good anatomical reason why they should form there between the oblique and the fundiform fibres of the inferior constrictor. It was an entirely different thing from the traction pouch. The pressure pouch was invariably on the posterior wall of the food passage.

Traumatic (Rabbit-bone) Perforation of Œsophagus into Aorta ; Necrosis of Mediastinal Tissues ; Hæmorrhage into Œsophagus, Stomach and Bowels.—W. Milligan, M.D.—Male, aged nineteen, was admitted with a history of hæmatemesis, attributed to having swallowed a small piece of rabbit-bone ten days previously. On admission the patient was found to be pale and anæmic, with a small and rapid pulse. With the fluorescent screen no evidence of any bone could be seen in the œsophagus. Under chloroform the œsophagus was carefully examined with the œsophagoscope (dorsal position). About the level of the carina a small red granulation was seen projecting from what appeared like an ulcerated surface, but there was no evidence of any bone, or, at the time of examination, of any hæmorrhage. No attempt was made to disturb the granulations. Death took place two days later, after

a very severe attack of hæmatemesis. *Post-mortem report.*—At the level of the tracheal bifurcation and on that part of the wall of the œsophagus contiguous to the aorta is an irregular ulcer about three eighths of an inch in diameter, with irregular margins, not thickened, and with a necrotic, blackened, slightly depressed base. The base of the ulcer lies against a blackish mass of necrotic tissue in the mediastinal cellular tissue which connects the œsophagus with the arch of the aorta; this mass of tissue covers the area of the little finger-nail. There is a perforation in a zone of black necrotic tissue affecting the whole coats of the aorta over a small area, about one eighth of an inch in diameter, lying on the wall of the aorta below the origin of subclavian artery. On the œsophageal wall there is another necrotic patch on the opposite wall to that above affected, and about three quarters of an inch lower down the gullet. This necrosis is confined to the mucous membrane, and is not definitely ulcerated and only covers an area of about one-eighth of an inch in diameter. Specimen and photograph shown.

Chronic Sinusitis of Ethmoid and Sphenoid, giving rise to Oculo-orbital, with absence of Intra-nasal, Symptoms.—J. Malcolm Farquharson, M.B.

—Mrs. B —, aged thirty-four, referred on November 23, 1911, from the Ophthalmic Department for examination. Complained of frontal headache, accompanied by swelling over the lower part of forehead, eyelids, and extending downwards to the upper part of cheek; a fortnight's duration. Previous health and family history good. Examination showed considerable swelling and œdema of the lower frontal region; proptosis of eyeball; marked ptosis; diminution of muscular movement of the eyeball, sixth nerve being least affected; pupil dilated; fundus and disc normal. Vision: right eye at two feet; left eye $\frac{3}{60}$.

Anterior Nares.—Beyond a slight hypertrophy of right middle turbinate, which was touching septum, normal; posterior rhinoscopy; absence of crusts, pus, atrophy, hypertrophy, or œdema of turbinates; Fränkel's posture test negative. Transillumination: Frontal and maxillary sinuses illuminate well. Patient advised to come into hospital for immediate operation, but was unable to do so till the 26th, when she returned with a marked cellulitis over the swollen areas. Next morning on removal of bandage she complained of blindness, only being able to distinguish light from darkness. Edges of right disc blurred; vessels full; left fundus normal; right pupil does not react to light. Operation. Periosteum detached from the inner nasal wall and floor of frontal sinus to close proximity to optic nerve. No pus or any bone lesion observed. On dissecting sac from lachrymal bone a drop of pus was found between these structures. The ascending process of superior maxilla was resected; anterior ethmoidal cells opened and found healthy. Some granulations were found in the posterior ethmoidal cells, especially in one large cell just in front of sphenoid; one or two points of pus also observed. Sphenoid: large cavity; full of œdematous granulations; no pus, frontal sinus opened; healthy; very large, extending outwards to external anterior process, and high up vertically. Some infected wandering fronto-ethmoidal cells met with and removed. Right middle turbinate amputated, and the fronto-nasal passage enlarged. Patient did well, wound healing without suppuration and the œdema rapidly disappearing. By December 6 could distinguish shadow of two fingers. Movement of globe increased; upper eyelid can be partially elevated. Dr. Paterson reports that there is a marked pallor of disc, with commencing atrophy. Fingers at a foot and a half; light reflex present, though sluggish. December 20—left

infirmity; vision not improved further; globe movements now normal, no deformities. May 28—Returned with a slight swelling over the inner surface of ala of nose just internal to lachrymal; small fistula, probe passing up to frontal sinus. Frontal sinus reopened and a Killian performed. Case took normal course; dismissed well on June 28; no perceptible deformity. Since then patient has kept well. No further improvement in vision.

Large Cyst of Arytænoid and Ary-epiglottic Fold.—**J. Malcolm Farquharson, M.B.**—Male, aged forty-six, sought advice on May 23 last for difficulty in breathing. No previous illness until five years ago, when he gradually became husky without apparent cause. This varied much in intensity. Six months before admission suddenly lost his voice, and could only speak in a whisper. Absence of pain, cough, or secretion. On admission, was suffering from marked dyspnoea. The whole of the right arytænoid and ary-epiglottic fold was very swollen, of a dark red colour, giving the appearance of a solid pear-shaped mass. At one spot—the most anterior part of the ary-epiglottic fold—dilated vessels coursing over the surface could dimly be made out. Swelling so large as to interfere with air-way. Edge of right cord only seen on account of swelling of ventricular band; a portion of the latter only visible. Rest of structures in larynx normal. Movement of cords and of crico-arytænoid joints normal. Efforts made with punch forceps to remove a portion, but owing to very tense condition of walls, unable to get a bite. Incision made into most prominent part of swelling; large quantity of watery fluid of a faint yellowish colour escaped under pressure; fluid unfortunately lost. Examination now showed normal configuration of larynx. Portion then cut out of cyst-wall. Kept in bed; ice for twenty-four hours, followed by steam benzoin inhalations. Did well for four days when suddenly seized with increasing dyspnoea and sensation of choking. Examination showed entire larynx intensely inflamed. Enormous swelling of the entire arytænoid and ary-epiglottic fold up to and involving the lower half of epiglottis. Right cord and crico-arytænoid joint fixed. Incisions made over swelling; very free hæmorrhage; great relief obtained. Swelling gradually disappeared under rest and steam inhalations. Dismissed ten days later, when swelling had almost disappeared. Some movement of right crico-arytænoid joint, which is slightly swollen. Present condition of larynx normal.

Intra-nasal Radical Maxillary Antrum Operation.—**J. D. Lithgow, M.B.**—The purpose of the operation is to provide free and permanent access to the maxillary antrum for intra-nasal inspection and drainage. The operation is performed under local anæsthesia and consists of two stages, separated by an interval of a month or so; the second stage is preceded with only in the event of a cure not resulting during the intervening period. *First stage:* The region of the inferior turbinate and meatus is carefully dried and packed with 10 per cent. cocaine and adrenalin solution. After ten minutes the packing is removed from the inferior meatus and Blegvad's strong solution of cocaine substituted:

Cocaine	1.0
Salicylic acid	1.0
Adrenalin	gtt. 1.0
Absolute alcohol	2.0

In five minutes the plugs may be removed, and the antrum is punctured with Myles' antral trocar about an inch from its anterior extremity

and as near the floor as possible; the handle of the instrument is then rotated around its long axis through a half circle and slowly withdrawn until the back-cutting edge of the trocar is felt to be impacted near the antero-inferior angle of the antrum; the instrument is then inclined more towards the septum of the nose and withdrawn with a screwing movement. A slot of about an inch in length by one eighth of an inch in breadth is thus cut in the inferior meatal wall of the antrum. The corresponding strips of bone and mucosa will be found adhering to the ring of the trocar and may be examined microscopically. The contents of the antrum may then be aspirated through a silver Eustachian catheter and lavage performed. When the outflow is at last clear the patient should occlude the nostrils and blow out the remaining fluid in the antrum *via* the catheter. The inferior meatus is now plugged with bismuth gauze, which may be removed during the course of the day. Lavage of the antrum should be carried out at regular intervals by means of the catheter, which can hardly fail to hit off some portion of the slot in the antral wall on the subsequent lavages. If, at the end of five or six weeks, the discharge still continues, one then passes on to the *second stage*: The antrum is douched and dried as before; the patient then inclines the head towards the affected side, and thirty drops of the 10 per cent. cocaine-adrenalin solution is injected into the antrum through the catheter, and on withdrawing this the anterior half of the middle and inferior meatuses are packed with gauze similarly impregnated. The head is then inclined well towards the healthy side and slightly forwards. After ten minutes the plugging is removed from the middle meatus and the anterior half of the inferior turbinate is smeared all over with Blegvad's solution, working well up to the antral wall of the middle meatus and towards its anterior extremity. In a few minutes the mucosa assumes a snow-white appearance. The plug is now removed from the inferior meatus and the anaesthesia is complete.

The lower movable blade of Struycken's turbinotome is inserted into the antrum through the anterior extremity of the slot in the inferior meatus; the upper and fixed blade passes over the anterior extremity of the inferior turbinate at an angle of 45° ; the blades are then closed and a slot cut through the turbinate and antral wall. Before removing the forceps they are bent somewhat forcibly towards the septum, when the anterior extremity of the turbinate and the adjacent portions of the antral wall attached to it will appear in view. A strong snare is then passed around the projecting portion—the loop towards the septum, the barrel towards the antral side. On drawing up the loop one cuts through and removes a large triangular portion of antral wall with the anterior third of the inferior turbinate attached to it. The antrum should now be packed with a continuous strip of gauze wrung out of peroxide of hydrogen. The cut edges are powdered with orthoform or anaesthesin and then smeared with vaseline. The antral plug will be removed after the reactionary hæmorrhage has passed off.

The after-treatment consists in spraying the antrum with peroxide of hydrogen, douching with saline solution, and then insufflating a $\frac{1}{2}$ per cent solution of menthol in parolene. This may be intrusted to the patient. A large portion of the antrum may be seen on inspection by anterior rhinoscopy with the aid of the lateral rhinoscopic mirror; and should a Holmes's pharyngoscope be available, then the whole extent of the cavity may be seen. This in part answers one of the principal objections to the intra-nasal route, that the antrum can neither be inspected nor curetted.

Dr. SYME said that though Dr. Lithgow's operation was ingenious he did not see the need of it. The Caldwell-Luc operation could be carried out under local anæsthesia, and the results were so satisfactory in the great majority, he was almost tempted to say in all of cases, that he did not understand the indication for an extended intra-nasal procedure.

Dr. LITHGOW replied that he looked upon his method as more simple than the Caldwell-Luc, hence its indication both from the surgeon's and the patient's points of view.

Retro-Pharyngeal Abscess in an Adult aged fifty; Incision; Cure. Patient shown.—J. D. Lithgow, M.B.

Singer's Node removed by Indirect Method.—W. G. Porter, M.B.—The case illustrates the possible pathology of some of the cases. M. C——, aged twenty, a rubber-worker, gave a history of hoarseness of a year's duration. On examination a small white projection was seen on the edge of the right vocal cord and near its centre; it had the typical appearance of a singer's node. It was removed by Moritz-Schmidt's forceps by the indirect method. The section shows a pear-shaped projection composed internally of a young vascular connective tissue showing very little sign of reaction. The central part of the growth is occupied by some blood-clot, which in one part is undergoing slight organisation. The surface is covered by normal epithelium, in character similar to that which covers the vocal cord. Dr. Shennan concludes that the growth is of the nature of simple papilloma.

Singer's Node in Ozæna Subject; Node cauterised; Ozæna improved by Vaccine.—W. G. Porter, M.B.—N. B——, aged twenty-five, has a good alto voice, although suffering from ozæna, for which she has been treated by daily lavage for two years. This kept the symptoms in abeyance. Hoarseness developed in July, 1911, and at that time a very slight projection was seen on left cord. Voice rest was ordered, but the condition got worse and singing was impossible. In November, 1911, a typical singer's node had developed; it was destroyed by the cautery by the indirect method. The burn was slow in healing, but the functional result has been perfect. The patient has had symptoms of ozæna for five years. Dr. Struthers Stewart investigated the bacteriology of the discharge (February, 1912), and isolated an organism resembling Abel's bacillus in almost pure culture. From this he prepared a vaccine. The first inoculation of 10 millions was given February 29, 1912; the inoculation was repeated weekly thereafter for four weeks, the dose being increased to 50 millions. The crusting had by this time definitely diminished. Five more injections were given between March 29, 1912, and June 6, 1912, and since the latter date syringing has been entirely stopped. The dose has now been increased to 300 millions, and, in all, eighteen inoculations have been given. The nose when examined on November 14, 1912, was free from crusts, and there was no trace of odour. The patient is free from headaches, and there is no feeling of dryness in the throat.

Ozæna treated by Vaccine.—W. G. Porter, M.B.—L. L——, aged fifteen, suffered from symptoms of ozæna for a year, blocking of nose, discharge from back of nose, headache and fetor. Discharge examined by Dr. Struthers Stewart, an organism resembling Abel's bacillus isolated, and vaccine prepared; first inoculation 10 millions, March 7, 1912.

After six inoculations the lavage of the nose was stopped on May 30, 1912; the crusting had then diminished, and the subjective symptoms were greatly relieved. Since that date had had six inoculations, the last, August 1, 1912, of 40 millions; the nose has remained free from crusts and there is no odour.

Dr. PORTER said that he had another case under treatment by this method, but that there had not yet been time to judge of the effect. The two cases shown did not now require douching. He did not claim that these cases proved anything, but they were suggestive, and he thought the method of treatment by vaccine worthy of further trial.

? Fibroma of Pharynx.—J. M. Darling, M.B.—Male, aged forty-five, complains of something moving about loosely in his throat when he swallows. There is a pendulous pyriform mass between the left faucial pillars; situated often below the level of the depressed tongue, and not visible on first examination: free at upper pole: attached to and slung from the anterior pillar; hanging towards the middle line; smooth; no ulceration; glides freely up and down with the movements of deglutition; no glandular enlargement. A piece was snipped off from upper and inner aspect for microscopic examination. Structure—fibroma (? malignant). Section also shown.

Dr. BROWN KELLY said cases such as Dr. Darling's were rare. He had had one in which the growth was attached to the lateral wall of the pharynx, and there was no recurrence up to the time of the man's death seven years later. He knew of three other cases in which a similar growth sprang from the soft palate, epiglottis, and lateral wall of the pharynx respectively. All of these were malignant.

Keratoses of Larynx and Trachea.—A. Brown Kelly, M.D.—Man, aged twenty-one. Hoarseness set in gradually about eighteen months ago; at present not so marked as previously. No other symptom. Local appearances have remained almost unchanged since coming under observation three months ago. On the anterior two thirds of the slightly red left vocal cord is an irregular white formation, like curd. In the trachea, on its anterior wall, are three or four tiny white prominent points. No keratosis in pharynx. The excrescence on the vocal cord was removed, but recurrence took place in a few days. Dr. Abel prepared films and sections from the excrescence, and found that the former showed a few leptothrix filaments and small cocci or bacilli, while the latter were mainly composed of strata of flattened epithelial cells, surmounted by broken strata similar to those of the cornified layer of the skin.

Dr. LOGAN TURNER showed a coloured sketch of a case which had been under his care where there were the same microscopic findings. Neither in Dr. Kelly's case nor in his was there any pharyngeal keratosis. His case was published in the *Edinburgh Medical Journal*, April, 1906.

Osteo-Fibroma of Superior Maxilla.—James Adam, M.D.—Female, aged twenty-five. Case was shown at the last meeting¹ as one of osteomata of both antra with symptoms of painless increase for seven years, causing bulging of alveolar ridge and of hard palate downward, of nasal walls inwards, of antral walls forwards, and, on the left side, of nasal floor upward, and of orbital floor upward resulting in slight exophthalmos. Opinions expressed were that it was a case of tumour, of leontiasis, of cyst. Operation under infiltration anæsthesia; incision in

¹ JOURN. OF LARYNGOL., RHINOL., AND OTOL., vol. xxvii, p. 389.

gingivo-labial fold. The right anterior antral wall was as thin as paper, and dimpled on pressure; on the left the lower part of this wall had been quite absorbed, and the tumour lay under the mucous membrane. A solid tumour about the size of a Tangerine orange, filling the whole antrum with a few adhesions, was removed on each side; on the right there was a bony pedicle external to the pyriform orifice necessitating cutting with strong forceps: floor of orbit was opened on this side. No fistula remains.

Pathologist reports tumours to be fibromata with osseous changes. Sections shown.

Drs. W. G. PORTER and A. LOGAN TURNER showed skiagrams illustrating the mastoid region of the skull.

Dr. H. H. BOLTON showed a series of cultures of the *Bacillus proteus vulgaris*.

Drs. A. LOGAN TURNER and W. T. GARDINER showed pathological specimens illustrating tubercular ulceration of the trachea, syphilitic necrosis of the larynx, stenosis of the larynx after diphtheria and tracheotomy, meningitis secondary to sphenoidal sinus suppuration, frontal lobe abscess and meningitis secondary to accessory sinus suppuration and orbital abscess.

Dr. J. D. LITHEGOW showed:

(a) An improved form of guillotine for extra-capsular enucleation of the tonsils by the Whillis-Pybus method.

(b) A pair of mirrors, right and left, for lateral intra-nasal rhinoscopy (in connection with intra-nasal maxillary antrum operations).

(c) Some tonsils enucleated with the above guillotine.

Abstracts.

LARYNX AND TRACHEA.

Kellock, Thomas H.—Pneumonotomy for Foreign Body. "Proc. of Roy. Soc. Med.," vol. vi, No. 3, January, 1913, Clinical Sect., p. 64.

A boy, aged four and a half, swallowed a shawl-pin one and a half inches long, and was admitted four days later, on June 3, to hospital. A skiagram showed the pin at the level of the third rib, point upwards, apparently in the right bronchus. Attempts were made on four occasions, at first through the larynx, and latterly through a low tracheotomy wound, to remove the pin with the bronchoscope, but, although the pin was grasped more than once, the attempts failed. On June 22 a skiagram showed the pin lying near the diaphragm. On June 24 another attempt was made with the help of a gum-elastic catheter, with the bent-over end of the stylet projecting, controlled by the fluorescent screen. No success.

On July 3, operation. The child had a slight cough, offensive breath, no expectoration, was slightly anæmic, otherwise fairly well. The patient was placed on the left side. The marks made during localisation formed a guide where to open the chest-wall. The chest was opened by two flaps reflected backwards. The first consisted of skin and muscles, the second of parts of four ribs, intercostal muscles and pleura, making a window three inches square. The finger located a hard spot about the centre of the diaphragmatic surface. The lung was pushed up and an

incision made here three quarters of an inch deep. With the help of the fingers of the left hand in the sulcus between the middle and lower lobes, a finger in the incision felt the pin, which was easily extracted by sinus forceps. A little foul pus followed it out of the wound in the lung. There was very little hæmorrhage. A small drainage-tube was inserted down to the incision in the lung. Morphia gr. $\frac{1}{6}$ was administered. The pin was one and a half inches long, with a glass head one eighth of an inch in diameter. The child was very restless for a few days (temp. 101° – 102° , pulse 150–160, respirations 44–50), and began to improve on the seventh. Now the chest moves well, there is no scoliosis, and air enters the greater part of the lung.

Raymond Verel.

NOSE.

Whale, Harold—Spasmodic Rhinorrhœa cured by Irrigation of the Maxillary Antra, which were infected by *B. Coli*. "Lancet," October 12, 1912, p. 1012.

A healthy athlete of twenty-five "Hay fever" four years. Both antra dark to transillumination. Both were tapped, and pus found, yielding a pure culture of *B. coli*. An autogenous vaccine was made. Cure was remarkably rapid.

Macleod Yearsley.

Sluder, G.—Vacuum Nasal Headaches with Ocular Symptoms only. "Annals of Otol., Rhinol., and Laryngol.," xxi, p. 160.

Refers to a class of nasal headache due to closing of the frontal sinuses or of the anterior ethmoidal labyrinth. The eye disturbance is of the nature of asthenopia. Headache is usually frontal, growing worse on using the eyes. Nasal symptoms are usually absent, but the nasal origin is revealed by tenderness of the upper inner angle of the orbit at the point of attachment of the pulley of the superior oblique and internal and posterior to it. Sluder details six ways in which the frontal sinus may become closed: (1) Enlargement of the tubercle of the septum; (2) lapping down of the middle turbinate; (3) hypertrophy of the middle turbinate; (4) œdema of soft tissues of vault of middle meatus; (5) in normal noses by bony narrowing, the uncinate process and bulla being in contact; (6) empyemas or coryzas which have got well but left some swelling. As regards treatment, applications of such astringents as 2 per cent. silver nitrate are often sufficient, but operation, according to the condition found, is sometimes required.

Macleod Yearsley.

Wishart, D. J. Gibb.—The Relation of Accessory Sinus Disease to General Medicine. "The Canadian Practitioner," March, 1912.

This paper, which indicates much care in preparation, and contains a *resumé* of the author's personal experience in observation of diseases of the sinuses, covers a wide field. Mention is made of the facts that Ziem, only a quarter of a century ago, opened up the subject of the sinuses for observation; that Morell Mackenzie, in his work of 1882, does not mention the subject at all; that Hyrtl the same year stated that the sphenoidal sinus was outside the field of observation; and that in 1885 Schoffer was the first surgeon to operate on the sphenoidal sinus upon the living subject.

In dealing with the minute anatomy of the sinuses the writer dwells particularly upon the importance of the venous and lymphatic drainage as indicating the possible direction of absorption processes. He also

refers to the peculiarities of formation of the sinuses. In 10 per cent. of maxillary sinuses there is an accessory ostium below the uncinate process and behind the common ostium. Also large anterior ethmoidal cells may occupy the place of the frontal sinus, and when present they may interfere with the fronto-nasal duct.

The interesting relationship of the sphenoidal sinus to the olfactory, optic and sphenopalatine nerves and the reflex infra-orbital neuralgia which is often associated with sphenoidal sinusitis do not escape the author's attention.

The paper is intended to deal with suppurative diseases of the sinuses only, and closes with a *resumé* of forty-three cases which have passed under the writer's observation in private practice. Of these, eight are noted as frontal, nine as maxillary, twelve as ethmoidal, one as sphenoidal, and the remaining thirteen as a combination of diseased conditions in two or more of the sinuses.

The last case, No. 43, the writer makes a special note upon. The patient, male, aged twenty-nine, had suffered for years from terrible headaches in both frontal regions. During this period his physician had frequently given him injections of morphine when the pain became unbearable. The attacks were intermittent, formerly every four or six weeks, latterly two or three times a week, lasting for many hours until relieved by natural or acquired sleep.

The nasal discharge was thick and yellow, but free from odour. There was very slight optical defect. When first examined by the writer there was no discharge, and the nose was remarkably free from obstruction. The right middle turbinal was rather close to the septum and slightly coated. Transillumination showed right antrum and frontal sinus darker than the left. On washing, a teaspoonful of odourless pus was washed from right antrum, but none from the left or from the frontal sinus. Several days later patient had a burst of blood and pus from his nose. On washing antrum again no pus was obtained. While discharge was free the headache was relieved, but pain returned on cessation of the flow.

It was then decided to remove the entire middle turbinal and some of the posterior ethmoid cells. A week later the patient felt much better. A further curetting was done, but no pus found. This time the cure of the headache was complete.

Price-Brown.

EAR.

Frey, Hugo.—The Auditory Apparatus in relation to Syphilis and Antisyphilitic Therapy. "Die Heilkunde," Jahrg. 1911, No. 11.

Primary sores in relation to the ear are not so rare as might be imagined. That most commonly met with is in the neighbourhood of the pharyngeal orifice of the Eustachian tube, the virus having been transmitted by an infected catheter. Though macules and papules may occasionally be observed in the external auditory meatus or on the membrana tympani, secondary syphilitic manifestations in the ear are usually of a catarrhal nature and secondary to a specific lesion in the nose or naso-pharynx. The same applies to tertiary lesions in these regions. Early treatment will prevent such sequelae. Syphilitic affections of the inner ear may be either labyrinthine or retro-labyrinthine, and may manifest themselves at an early or late period of the disease. The accompanying symptoms and a functional examination of the internal ear will indicate whether the vestibular or cochlear branch of the nerve

is mainly involved. The acoustic nerve is sometimes implicated in syphilitic basal meningitis. Deafness is one of the cardinal symptoms of hereditary syphilis, and may be accompanied by labyrinth symptoms, either sudden or gradual in onset. Syphilis is a prolific source of deaf-mutism. Forty per cent. of cases of inner ear disease examined by various authors have given a positive Wassermann reaction. The results obtained by treating recent syphilitic ear disease with salvarsan have been decidedly encouraging. It has been contended by some authorities that internal ear disease, which appeared shortly after the injection of salvarsan, was due to direct toxic action of this drug upon the acoustic nerve. This is however, not the case. Slight lesions of the nerve probably existed in these cases before the drug was exhibited. The subsequent exacerbation may be compared to Herxheimer's skin reaction, but owing to the anatomical position of the nerve the inflammation takes longer to subside and a somewhat different clinical picture is accordingly produced. When the nerve becomes affected from one to three months after the injection, there are three arguments used to show that the drug is to blame: (1) Other arsenical preparations exert a toxic influence on the vestibular nerve. (2) In the older methods of treatment affections of the internal ear in cases of recent syphilis were "almost unknown." (3) That the Wassermann reaction was often negative in these cases. Though vestibular symptoms were produced in animals by arsacetin, such symptoms were wanting in the same animals when given arsenobenzol. The amount of arsenic in arsacetin which produced toxic symptoms was larger out of all proportion to the amount given therapeutically in salvarsan. We are now aware that syphilitic manifestations may occur even though the Wassermann reaction is not always positive. There are numerous cases on record in the literature to prove that affections of the inner ear in recent syphilis were not "almost unknown" in the pre-salvarsan period. These cases did not excite sufficient interest—especially regarding their time relation to infection—to justify their publication. The functional examination of the inner ear has only recently attained clinical accuracy and importance. Ehrlich maintains that the syphilitic virus may remain pent up in an active condition in the nerve owing to an endarteritis of the nerve-vessels which prevents the salvarsan from sterilising these foci; the latter may be responsible for subsequent nerve symptoms, though unable, owing to their isolation, to influence the Wassermann reaction. It has yet to be proved that this drug can injure the acoustic nerve, and it would therefore be wrong to withhold salvarsan on these grounds.

J. B. Horgan.

Olsho, S. L.—**Untoward Effects of Salvarsan referable to the Eye and Ear.** "Therapeutic Gazette," No. 6, June, 1912.

A summary of the evidence on the by-effects on the sense-organs of sight and hearing, attributable to the toxic action of salvarsan.

Auditory and labyrinth disturbances have been reported by many observers. Von Zumbusch collected 9 cases among a total of 7000 cases treated. Beck found 3 cases among 100 syphilitics in Urbantschitsch's clinic.

In the latter series the symptoms appeared in from five to nine weeks after treatment, and in one other case Ménièreiform changes appeared four months after injection. In none of these cases did the symptoms yield to treatment. Beck remarks that ear affections in untreated syphilis are comparatively rare, while they have become unusually common since the introduction of salvarsan. Mayer, basing his observations on cases of

syphilis observed before the introduction of salvarsan, states that the auditory nerve is liable to become affected as early as six weeks after infection, and that auditory trouble is most common in the first six weeks.

Ehrmann, Frey and Wechselsmann are quoted as of opinion that these changes are directly due to the specific infection. Ehrlich claims that the disturbances occurred only in patients treated subcutaneously, namely by a single dose, not followed by forced administration of salvarsan; that the patients were always within two to eight months of infection, and in most of the cases the Wassermann reaction was negative. He states that the same symptoms are observed in recent syphilitics treated with mercury; that the physicians who used the largest doses of salvarsan did not observe these disturbances; and that some of the cases were benefited by antisymphilitic remedies or even by additional salvarsan.

Ehrlich concludes that optic and acoustic disturbances are natural phenomena in recent syphilis, and are not manifestations of the toxicity of salvarsan.

Knowles Renshaw.

PHARYNX.

Scales, J. L.—(? Epithelioma cured by Salvarsan.) Pharyngeal Ulcer: Report of a Case with Unusual Features. "New Orleans Med. and Surg. Journ.," November, 1912.

The patient gave a history of sore throat for six months. When seen there was an ulcer involving most of the posterior pharyngeal wall and the posterior pillars of the fauces. The character of the edge of the ulcer is not described, but the surface was covered with necrotic tissue and extremely foul. The patient denied syphilis, but apparently he had been receiving anti-symphilitic treatment. A small piece of tissue from the ulcer was sent to be examined histologically. The Wassermann reaction was also tested, and found to be positive. "606" was then administered intra-venously, with marvellous result; the ulcer healed rapidly, and the patient gained 20 lb. in weight in a few weeks. A few days after the injection, the pathologist who had examined the tissue from the ulcer reported that it was an epithelioma. The subsequent history of the case, which would be most interesting, is not given.

Knowles Renshaw.

REVIEWS.

Vicious Circles in Disease. By JAMESON B. HURRY, M.A., M.D. Cantab. With illustrations. Second and enlarged edition. London: J. & A. Churchill, 1913.

An erudite and finished account of the many vicious circles in disease. Perhaps the account is a little too complete in one direction and not quite complete enough in another, for the impression it left upon at least one reader's mind was that pathological processes in general are solely made up of a complicated series of morbid gyrations. This, of course, may be the impression Dr. Hurry intends to convey. In that case, however, the doubting Thomas would want to know whether morbid processes in the living body do not sometimes move straight to their goal; and if so, why the author does not allude to this other variety, merely by way of balance or proportion, if for no other reason.

Be this as it may, the book undoubtedly fills a gap—this is the second

edition—and it is interesting, among other things, because it emphasises the change which, within living memory, has stolen over pathology; that change, namely, which has brought pathology from the dead-house to the bedside, and has transformed it from a mere description of lifeless matter into a science which deals with morbid activity in living tissues.

The only addition to the book that might be suggested is an account of the manner in which the old term in *Logic* (*the vicious circle*) found its way into Medicine. Frankly, we think the phrase inapt though picturesque, and for that reason ill-adapted to matters scientific. Perhaps, however, in his next edition Dr. Hurry will be able to remove our prejudices.

The book is very gorgeously attired—gilt edges, Gothic page-headings, copious capital letters and a bewildering variety of type.

Dan McKenzie.

Meningitis, Sinus Thrombosis and Abscess of the Brain. By JOHN WYLLIE, M.D. Pp. ix + 258. London: H. K. Lewis, 1911.

Despite the large amount of literature which has accumulated round the intra-cranial complications of middle-ear disease, there is always room for a short and concise text-book, and, as such, Dr. John Wyllie's little work is welcome. The book is written with a desire to place in a small volume a consideration of diseases which in their early stages often exhibit a striking similarity of symptoms, and to differentiate between them as far as may be possible. In carrying out this purpose the author has found it necessary to exceed the limit which he marked out in order to include some description of the normal cerebro-spinal fluid and the changes it may undergo in disease of the central nervous system. He has also added some short description of nasal accessory sinus disease on account of the cranial complications to which it may give rise.

The volume is divided into five sections, dealing with causal diseases, meningitis, cerebral sinus thrombosis, intra cranial abscess, and differential diagnosis, and to these are added two appendices upon lumbar puncture and its uses, and the nasal accessory sinuses. The work ends with a list of references.

The work is eminently practical, and the author goes straight to the point without unnecessary verbiage. In dealing with symptoms he gives, where possible, the percentages of their occurrence. Kernig's sign he regards as valuable but by no means unequivocal.

Meningitis is discussed under the headings tuberculous, acute, traumatic, syphilitic, toxæmic, posterior basic and sporadic, and epidemic cerebro-spinal, all of which are clearly depicted. Under the term "Méningisme" or "Pseudo-meningitis" are discussed meningeal symptoms, "not founded upon pathological changes in the meninges," but probably toxic. Treatment appears to be quite up to date.

In dealing with cerebral sinus thrombosis a quite elaborate table is given as to its causation. Thrombosis of the lateral and sigmoid sinuses is rightly described as more frequent than that of any other, but only a meagre description, occupying two and a half pages, is given.

The chapter on intra-cranial abscess is good, but we should be glad to see the term "extradural" substituted for "subdural," and the latter name consigned to a well-deserved oblivion. An analysis of causes of cerebral and cerebellar abscess gives ear disease as 35 out of 59 and 37 out of 39 respectively.

An excellent chapter is that in which differential diagnosis is discussed, which adds greatly to the value of the book. It is most clearly expressed and concisely stated.

MacLeod Yearsley.

CORRESPONDENCE.

THE GUILLOTINE ENUCLEATION OF THE TONSIL.

To the Editor of THE JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND
OTOLOGY.

SIR,—We frequently see the method of removing the tonsils by pressing the tonsil with the finger from above downwards into the ring of the guillotine described as the "Sluder method," but I venture to think it is quite an open question whether the credit of priority is rightly ascribed to Sluder instead of Whillis and Pybus, of Newcastle. I have endeavoured to trace the original communications, and, as far as I can gather, the method was shown and described at the Northumberland and Durham Medical Society, January 20, 1910, and again at the Clinical Society, Newcastle, on April 7, 1910, and it was not until the meeting of the American Medical Association, June 9 of that year, that Sluder first described his method. Whillis and Pybus published a paper which they had read before the Northumberland and Durham Medical Society on March 18, 1910, in the *Lancet* of September 17, it having been sent up on May 28. Sluder published his first report in the *Journal of the American Medical Association*, July 2, 1910. Both Whillis and Pybus and Sluder have respectively published papers since, but that does not affect the question of priority.

Unless I am mistaken, there is no doubt that the method was first described before a medical meeting by Whillis and Pybus, and they also made a written communication, and it is unfortunate, owing to the fact that it was not published until September, that it appeared after the published report by Sluder in July, more particularly if the English paper was held up from May 28 to September 17.

If any of your readers can adduce further evidence on the point I have raised, or correct any error into which I may have fallen, I shall be glad.

I am,

2, Rodney Place,
Clifton, Bristol;
March 29, 1913.

Yours faithfully,

P. WATSON-WILLIAMS.

XVIIIth INTERNATIONAL CONGRESS OF MEDICINE, LONDON, 1913.

SECTION XV.—RHINOLOGY AND LARYNGOLOGY.

OFFICERS.—*President*: Sir StClair Thomson. *Vice-Presidents*: J. B. Ball, J. W. Bond, J. Dundas Grant, D. R. Paterson, Herbert Tilley, A. Logan Turner, P. Watson Williams, Gibb Wishart, R. H. Woods. *Council*: H. S. Barwell, F. W. Bennett, Adolph Brommer, J. W. Browne, H. J. Davis, J. Donelan, J. Walker Downie, G. William Hill, J. Middlemass Hunt, W. H. Kelson, H. Lambert Laek, W. Lamb, Greville Macdonald, John MacIntyre, W. J. C. Nourse, C. A. Parker, L. H. Pegler, W. Permewan, H. W. F. Powell, H. Betham Robinson, F. A. Rose, P. R. W. de Santi, Sir Felix Semon, E. B. Waggett, G. Wilkinson. *Secretaries*: Douglas Harmer, A. Brown Kelly, Dan McKenzie.

PROGRAMME OF MORNING DISCUSSIONS (at 9.30 a.m.).—*Thursday, August 7*.—"On the Recent Progress of Endoscopic Methods as Applied to the Larynx, Trachea, Bronchi, Esophagus and Stomach." Reporters: Prof. G. Killian and Prof. Chevalier Jackson. *Friday, August 8*.—Conjoint Meeting. (The President of the Section of Laryngology to preside.) "The Methods and Results of Treatment of Diseases of the Throat, Nose and Ear by Salvarsan and other Arsenical Compounds." Reporters: Prof. P. Gerber and Dr. André Castex. *Saturday, August 9*.—"Indications for and Relative Values of Tonsillotomy and Tonsillectomy." Reporters

Prof. H. Burger and Dr. J. L. Goodale. *Monday, August 11.*—Conjoint Meeting. (The President of the Section of Otology to preside.) "The Special Treatment of the Throat, Nose and Ear during the Active Stages of Certain Infectious Fevers, namely, Scarlet Fever, Measles, German Measles, Mumps, Influenza, Typhoid, Whooping-cough, Smallpox, Chickenpox, Erysipelas, Anterior Poliomyelitis and Cerebro-spinal Meningitis (Diphtheria excluded)." Reporters: Dr. Victor Delsaux and Dr. E. W. Goodall. *Tuesday, August 12.*—"The Pathology and Treatment of Malignant Growths of the Nose and Naso-pharynx (Fibroma to be excluded)." Reporters: Prof. G. Ferreri, Dr. H. Marschik, and Dr. E. Lombard.

AFTERNOON SESSIONS (3 p.m. to 6 p.m.).—These will be devoted to papers offered by members of the Section, the Staff of the Section having power of selection from the papers offered. Not more than fifteen minutes will be allowed for the reading of any one paper, and not more than ten minutes for any speech in the discussion thereof.

MUSEUM.—This will include specimens, macroscopic and microscopic, and other exhibits to illustrate—(1) Neoplasms of the nose, accessory sinuses and naso-pharynx (excluding mucous polypus). (2) The rarer forms of laryngeal tumours, including post-cricoid carcinoma. (3) Diseases of the trachea and bronchi. (4) Diseases of the pituitary body. There will be an exhibition of instruments to illustrate recent improvements in broncho-cesophagoscopy, and the Committee is prepared to arrange for a limited number of short demonstrations in the Museum at stated hours. Members who desire to lend material for exhibition are requested to communicate with Dr. McKenzie. *Museum Committee:* J. W. Bond (*Chairman*), A. Logan Turner, L. H. Pegler (*Curator*), Dan McKenzie (*Secretary*), 62, Brook Street, London, W. *Acting Secretary:* Douglas Harmer, 45, Weymouth Street, London, W.

SECTION XVI.—OTOLOGY.

OFFICERS.—*President:* Arthur Cheate. *Vice-Presidents:* Thomas Barr, H. S. Birkett, Mark Hovell, Edward Law, J. Kerr Love, William Milligan, Urban Pritchard, Percy Webster. *Council:* J. Stoddart Barr, G. Nixon Biggs, J. McKenzie Booth, H. H. B. Cunningham, J. Gay French, Cecil Graham, Albert A. Gray, Thomas Guthrie, Somerville Hastings, Seccombe Hett, W. Jobson Horne, Hugh E. Jones, Richard Lake, H. J. Marriage, Frank Marsh, R. P. Mathers, W. M. Mollison, F. O'Kinealy, W. S. Syme, Hunter Tod, A. R. Tweedie, C. E. West, F. H. Westmacott, A. L. Whitehead, Macleod Yearsly. *Secretaries:* J. S. Fraser, G. J. Jenkins, Sydney Scott, Patrick Dempsey.

PROGRAMME OF MORNING DISCUSSIONS.—*Wednesday, August 6, 3 p.m.*—"The Surgical Anatomy of the Mastoid Region." Reporter: Prof. Mouret. *Thursday, August 7.*—"Pathology of Deaf-Mutism." Reporters: Prof. Alfred Denker and Prof. Holger Mygind. Demonstrator: Professor Siebermann. *Friday, August 8.* Conjoint Meeting. (The President of the Section of Laryngology to preside.) "The Methods and Results of Treatment of Diseases of the Throat, Nose and Ear by Salvarsan and other Arsenical Compounds." Reporters: Prof. P. Gerber and Dr. André Castex. *Saturday, August 9.*—"Non-suppurative Diseases of the Labyrinth." Reporters: Prof. Gustav Alexander and Prof. Karl von Eicken. *Monday, August 11.*—Conjoint Meeting. (The President of the Section of Otology to preside.) "The Special Treatment of the Throat, Nose and Ear during the active stages of certain Infectious Fevers, namely, Scarlet-fever, Measles, German Measles, Mumps, Influenza, Typhoid, Whooping-cough, Smallpox, Chickenpox, Erysipelas, Anterior Poliomyelitis, and Cerebro-spinal-meningitis (Diphtheria excluded)." Reporters: Dr. Victor Delsaux and Dr. E. W. Goodall. *Tuesday, August 12.*—"Climatic and Occupational Influences in Diseases of the Ear." Reporters: Dr. Clarence J. Blake and Prof. Giuseppe Gradenigo.

AFTERNOON SESSIONS (3 p.m. to 6 p.m.).—These will be devoted to papers offered by members of the Section, the Staff of the Section having power of selection from the papers offered. Not more than fifteen minutes will be allowed for the reading of any one paper, and not more than ten minutes for any speech in the discussion thereof. Epidiascopic demonstrations will take place during the sessions.

MUSEUM.—This will include specimens, transparencies, and other exhibits to illustrate the anatomy, physiology, pathology, and surgery of the labyrinth. Members who desire to lend material for exhibition are requested to communicate with Mr. Mollison. *Museum Committee:* C. E. West (*Chairman*), A. A. Gray, H. J. Marriage, W. M. Mollison (*Secretary*), 48, Brook Street, Grosvenor Square, London, W.). *Acting Secretary:* Sydney Scott, 130, Harley Street, London, W.

NEW INSTRUMENTS, ETC.

MESSRS. MAYER & MELTZER'S CATALOGUE.

We have received from Messrs. Mayer & Meltzer, 71, Great Portland Street, W., a copy of their recently published catalogue, in which are effectively displayed the most up-to-date developments in the armamentarium of our speciality.

There is no need for us, at this time of day, to draw attention to the work of this old-established firm. Their instruments are to be seen everywhere, and by everyone, we believe, it is felt that the sound workmanship and lasting qualities of their productions are worthy of the highest traditions of British handiwork.

NOTÆ SUBSCRIPTÆ.

THE INTERNATIONAL PRIZES IN OTOLGY.

There are three prizes in otology awarded at each International Otolgical Congress in recognition of important scientific work in the field of otology; namely, the Lenval, the Adam Politzer and the Cozzolino prizes. The following were the awards made at the International Otolgical Congress at Boston last year:

The Lenval prize was divided between Dr. Walther Kolmer, Vienna, and Dr. George E. Shambaugh, Chicago.

The Adam Politzer prize was divided between Dr. Robert Bárány, Vienna, and Mr. A. H. Cheate, London.

The Cozzolino prize was awarded to Dr. Max Görke, Breslau.

Our readers will note with pleasure the appearance of Mr. Arthur Cheate's name among those deemed worthy of highest honours in otology, and we heartily congratulate our fellow-countryman upon this international recognition of his arduous and successful work upon the temporal bone.

Dr. JOHN SENDZIAK (10 Erywanska Strasse, Warsaw, Poland, Russia) writes: "Being occupied with the history of tuberculosis, syphilis, as well as malignant tumours of the upper air-passages, I take the liberty to beg the distinguished readers of the JOURNAL OF LARYNGOLOGY, RHINOLOGY AND OTOLGY, to send to me kindly any reprints dealing with these subjects, for which I render *à priori* my sincerest thanks."

BOOKS RECEIVED.

Vicious Circles in Disease. By *Jamieson B. Hurry*, M.A., M.D. Cantab. With Illustrations. Second and enlarged edition. London: J. & A. Churchill, 1913.

Eye-strain in Everyday Practice. By *Sydney Stephenson*. London: The Ophthalmoscope Press, 1913. Price 3s. 6d. net.

Sclero-corneal Trephining. By *R. H. Elliot*. London: The Ophthalmoscope Press, 1913. Price 7s. 6d. net.

The Pituitary Body and its Disorders. Clinical States Produced by Disorders of the Hypophysis Cerebri. By *Harvey Cushing*, M.D. Philadelphia and London: J. B. Lippincott Company.

Handbuch der speciellen Chirurgie des Ohres und der Oberen Luftwege. Herausgegeben von *Drs. L. Katz, H. Preysing, and F. Blumenfeld*. 4 Bds., Lief. 1 2. Würzburg: Verlag von Kurt Kabitsch, 1912.

The Relations of the Lachrymal Organs to the Nose and Nasal Accessory Sinuses. By *Prof. Dr. A. Onodi*. With Photographic Reproductions, in natural size, of 45 Preparations. English Translation by Dr. Dan McKenzie. London: John Bale, Sons & Danielsson, Ltd., 1913.

THE
JOURNAL OF LARYNGOLOGY,
RHINOLOGY AND OTOTOLOGY.

Original Articles are accepted on the condition that they have not previously been published elsewhere.

Twenty-five reprints are allowed each author. If more are required it is requested that this be stated when the article is first forwarded to this Journal. Such extra reprints will be charged to the author.

Editorial Communications are to be addressed to "Editor of JOURNAL OF LARYNGOLOGY, care of Messrs. Adlard and Son, Bartholomew Close, E.C."

**REPORT FOR THE YEAR 1912 FROM THE EAR AND THROAT
DEPARTMENT OF THE ROYAL INFIRMARY, EDINBURGH.**

Under the charge of A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E.

PART IV.

**MALIGNANT DISEASE OF THE ŒSOPHAGUS, WITH
SPECIAL REFERENCE TO CARCINOMA OF THE
UPPER END: A CLINICAL STUDY BASED UPON AN
ANALYSIS OF SIXTY-EIGHT CASES OF TUMOUR.**

By A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E.,

Surgeon to the Ear and Throat Department, Royal Infirmary, Edinburgh;
Lecturer on Diseases of the Ear and Throat, University of Edinburgh.

THE increased attention which in recent years has been given to diseases of the gullet as the result of the introduction of the X rays and the improvements in the technique of œsophagoscopy, has led me to collect and analyse the records of my cases in which the chief clinical symptom was difficulty in swallowing. The records are taken from patients seen in hospital from 1907 to 1912, and from the notes of my private practice from 1902 to 1912 inclusive. Some of the cases therefore came under examination during a period prior to the more extended use of the œsophagoscope. Cases of difficulty in swallowing due to pathological conditions of the fauces and oro-pharynx and cases of obstruction as the result

of the impaction of foreign bodies in the œsophagus are not included within the scope of the paper.

The total number of patients complaining of difficulty in swallowing, which form the text of the paper, was 113. Of these, 45, or 39 per cent., were males, and 68, or 60 per cent., were females. The disparity between the two sexes is even more striking when we consider the figures derived from a study of the cases seen in private practice: here the proportion of females over males was rather more than two to one, 67 per cent. being women, and 32 per cent. men.

A diagnosis of malignant disease was made in sixty-eight cases; in the remaining forty-five an exact diagnosis was not arrived at. Various reasons may be given in explanation of this. From the very nature of the case a diagnosis cannot always be made at the first examination, and in a number of instances a second opportunity of elucidating the cause of the symptoms was never given. It is a well-known fact, too, that hospital patients are difficult to trace owing to the frequency with which they change their address, and often there is no medical attendant to whom application may be made for further information. Again, as some of the patients were examined comparatively recently their further progress still remains under observation. There is no doubt that the figures just quoted would be materially altered if further examination of the cases were possible. We believe that the proportion of cases of non-malignant disease of the œsophagus is not nearly so large as these figures indicate, and a study of the clinical records of those in which the diagnosis has not yet been made strengthens this belief.

Before studying in detail the clinical facts which have been compiled from an analysis of the sixty-eight cases of malignant disease, it will be well to briefly examine a few pathological data derived from the study of a series of *post-mortem* specimens. Malignant disease may attack any part of the œsophagus, but certain regions are said to be more commonly affected than others, namely the upper and lower ends of the tube, while the central portion is much less frequently the seat of disease. With the object of verifying this point, I have examined a number of pathological specimens, twenty-nine in all, contained in the Anatomical Museum of the University of Edinburgh, the Museum of the Royal College of Surgeons of Edinburgh, the Musée Dupuytren, Paris, and in my own collection. As a result of this examination the following facts have been elicited. In twelve cases the tumour was

situated at the upper end of the œsophagus; in four the lower end of the gullet was involved; in the remaining thirteen the disease occupied the middle portion of the tube at and about the level of the bifurcation of the trachea. Although the number of specimens examined is comparatively small, the above figures are of considerable interest on account of the large proportion of cases in which the central part of the œsophagus was the seat of the disease. An analysis of this last group shows that the tumour bears a close relationship to the bifurcation of the trachea. If we take 25 cm. as the average length of the œsophagus from the lower border of the cricoid cartilage to the cardiac orifice of the stomach the bifurcation of the trachea is found 11 cm. below the cricoid, and lies therefore just above the mid-point of the gullet. In six of the specimens the disease was seen to infiltrate the œsophageal walls at, above and below the level of the bifurcation, the vertical area involved not exceeding two inches. In four others the lower limit of the ulcer was opposite the bifurcation, and from this point the growth extended upwards for a distance of two inches. In two specimens the disease was described as involving the middle of the œsophagus; in the thirteenth the upper margin of the epithelial growth was situated at the level of the bifurcation, and from there it extended downwards for a distance of two inches. In the light of the information derived from these specimens it may be necessary to revise our views regarding the relative frequency of the occurrence of cancer in different parts of the gullet. Clinically, however, we have been unable to group any of our cases in this situation.

In the study of malignant disease of the upper end of the œsophagus it is necessary to take into consideration the hypopharynx or the *pars laryngea pharyngis*; this is the lowest portion of the pharynx situated behind the arytaenoid and cricoid cartilages and terminating below at the lower border of the cricoid plate, at which point the œsophagus commences. Examination of the twelve preparations of carcinoma of the upper end of the gullet demonstrated the fact that in six of them the disease involved the œsophagus only; in two of the specimens it extended from the lower margin of the cricoid plate downwards for one and two inches respectively. In three of the remaining specimens the upper limit of the disease was situated one inch below the mouth of the œsophagus, while in the fourth it was two inches below the orifice. In all of them the walls of the tube were involved from one to two inches in the vertical plane.

In the remaining six preparations the tumour implicated both the upper end of the œsophagus and the hypo-pharynx or post-cricoid region. Here also the walls of the œsophagus were involved for a distance varying from one half to two inches vertically. In the pharynx the extension of the growth upwards varied. In one specimen the disease had just invaded the pharyngeal mucosa, which was ulcerated upon the posterior aspect of the cricoid cartilage, while at a higher level one noted an area of œdema similar to what is observed clinically in some of these cases on laryngoscopic examination. In another specimen the posterior and right lateral walls of the hypo-pharynx were affected, and in a third the right lateral wall only, as far as the level of the ary-tænoid cartilage. In the three remaining preparations the whole circumference of the lower pharynx was involved, the disease infiltrating and ulcerating the mucous membrane covering the cricoid and ary-tænoid cartilages, and in two cases even destroying the ary-epiglottidean folds.

It is very difficult to determine from a naked-eye examination of each specimen the exact situation at which the disease commenced. Nor can we say definitely whether we have to deal with an extension of the disease downwards from the pharynx into the œsophagus or upwards from the œsophagus into the pharynx. More than one specimen clearly demonstrated, however, that the disease probably originated in the œsophagus and extended upwards into the pharynx. In one, nearly an inch of the œsophagus was infiltrated, while the tumour was evidently just invading the mucosa covering the cricoid plate. In another, the wall of the upper end of the œsophagus was much thickened, and on the left side the disease had eaten through it and infiltrated the tissues beyond, while the lumen of the tube was reduced to a narrow stricture. In the lower pharynx, on the other hand, the growth appeared to be more recent, the infiltration being confined to the mucous membrane of the posterior and right lateral wall, while the laryngeal structures were free from disease. The fact that the disease may be limited to the upper end of the œsophagus, while in no single instance was it found involving the hypo-pharynx alone, seemed to afford further evidence in favour of upward rather than downward extension of the growth.

The small number of specimens demonstrating carcinoma of the lower end of the œsophagus—four out of twenty-nine—is also of some interest. While this is in accordance with the clinical data, which will presently be dealt with, it must not be regarded as

furnishing evidence of an infrequent occurrence of the disease in this situation. In two of the four preparations the disease was confined to the œsophagus, but in the remaining two the cardiac end of the stomach was also affected. Here, again, it was difficult to form an opinion as to the actual site of origin of the tumour. It is possible that a certain number of museum specimens may be catalogued as cancer of the cardiac end of the stomach in which the disease originated in the lower end of the œsophagus, and further, there is no doubt that when the surgeon performs gastrostomy he frequently does so for carcinoma of the lower end of the gullet. In no specimen in the series was there any evidence of the disease involving more than one situation.

In contra-distinction to the grouping detailed in the pathological preparations, we find that the clinical cases in the series fell primarily into two groups, namely, sixty-two in which the tumour involved the upper end, and six in which the lower end of the œsophagus was affected. It has been found advisable, however, on clinical grounds to subdivide the cases of disease at the upper end into two sub-groups, namely, one in which the tumour undoubtedly involved the hypo-pharynx or post-cricoid region and the other in which the disease was either confined to the upper end of the œsophagus, or if the hypo-pharynx had also become infiltrated the tumour was not evident there on laryngoscopic examination. Even with the œsophagoscope it was not always possible to accurately define the anatomical upper limit of the growth. It is obvious that this is a somewhat arbitrary subdivision, because a study of the pathological specimens has shown that in every case in which the hypo-pharynx was affected the œsophagus was also involved. The subdivision has, however, been made upon a clinical rather than upon an anatomical basis, and for the following reasons: (1) The disease could be recognised in the hypo-pharynx by means of the laryngoscopic mirror; (2) it occurred in women much more frequently than in men, almost in the proportion of three to one in the series; (3) it affected women at an earlier age than it did in the other situations; (4) the disease was of shorter duration in this situation than when in the œsophagus. The following subdivision has therefore been made: Hypo-pharynx (post-cricoid), 26 cases, or 38 per cent.; upper end of œsophagus, 36 cases, or 52 per cent.; lower end, 6 cases, or 8 per cent.

CLINICAL DATA IN RELATION TO SEX, AGE AND DURATION OF THE DISEASE.

Sex.—The question of the relative frequency of malignant tumour of the œsophagus in the two sexes is one which has been considered by various writers, and in regard to which a difference of opinion has been expressed. Of the 68 cases in the series, 26 or 38 per cent. were males and 42 or 61 per cent. were females. There is here, therefore, undoubted evidence of the preponderance of the disease in the female sex. It is interesting to note in this connection that of the 42 women, 17 were unmarried, while the remaining 25 were married women. Butlin, in the second edition of his "Operative Surgery of Malignant Disease," 1900, states that malignant disease of the œsophagus occurs more frequently in men than in women. Butlin's statement has been confirmed by other writers. Thus, Morell Mackenzie, writing in 1884, found in a series of 100 cases that 71 were males and that only 29 were women. Habershon, in a table of 85 cases collected from Guy's Hospital *post-mortem* records (1878) noted the disease in 59 men and in 26 women. Other writers might be quoted showing somewhat similar figures. Walker Downie, on the other hand, in a paper recently published in the *Glasgow Medical Journal* (1912), states that he met with carcinoma in 13 men and in 15 women. The more frequent occurrence of the disease amongst women as shown by my figures is very striking. When studied in connection with the situation of the disease the following figures are obtained :

TABLE I.

				Males.		Females.
Hypo-pharynx	.	26	.	7	.	19
Upper end	.	36	.	14	.	22
Lower end	.	6	.	5	.	1

The disease therefore is more common in the hypo-pharynx in women, almost in the proportion of three to one, while at the lower end of the gullet there is a predominance of the male sex; the small number of cases of cancer at the cardiac end of the œsophagus does not permit of any general deduction being drawn from them; other writers have pointed out the greater frequency of the disease at the lower end of the œsophagus in men.

Age.—An inquiry into the age of the patients thus affected brings out some points of interest. It is at once evident that women are affected earlier in life than men, and the accompanying

Table II will not only illustrate this point, but it also shows the number of cases met with in the various decades.

TABLE II.

Decade.	Male.	Female.
31-40 . .	2 . .	13
41-50 . .	5 . .	16
51-60 . .	8 . .	12
61-70 . .	9 . .	0
71-80 . .	2 . .	1
	<hr/> 26	<hr/> 42

The majority of the women therefore were affected between the ages of thirty and fifty, the majority of the men, on the other hand, after fifty years of age. The youngest woman was thirty-one years old, the oldest seventy-one; the youngest male was thirty-four, the oldest seventy-six. The average age-incidence in the females was forty-five and in the males fifty-seven years. The average age-incidence in the unmarried women was forty-four, in the married women forty-seven years.

In connection with this subject it must be borne in mind that the figures just quoted refer to the age of the patient at the time of examination. As the duration of the symptoms in many of these cases extends over a long period, often for a number of years, it is obvious that in many patients the age-incidence occurs considerably earlier than these figures would indicate. While this statement necessarily applies to both sexes, it will be shown presently that symptoms of obstruction are as a rule complained of for a considerably longer period in the case of many of the women than in the case of the men. The earlier incidence of cancer of the œsophagus in women has long been recognised. Morell Mackenzie gives the average age-incidence in women as forty-four and in men fifty-two years, while Habershon's figures are very similar—in women forty-four years and in men fifty-five years.

The average age at which the disease is met with in the two sexes in the different situations is brought out in the next table.

TABLE III.

	Hypo-pharynx.	Upper end.	Lower end.
Males . .	58 years . .	59 years . .	52 years
Females . .	44 „ . .	47 „ . .	48 „ (one case).

These figures show that carcinoma occurs at an earlier age in women in the hypo-pharynx than elsewhere, but that in men it is met with earlier at the lower end of the œsophagus. An analysis of the ages of the nineteen women with malignant tumour in the hypo-pharynx shows that there were seven between thirty and thirty-nine years of age, eight between forty and fifty, and four between fifty and sixty. Malignant diseases in this situation may occur at an earlier age than the above figures indicate, and cases have been recorded from time to time in illustration of this point. Thus Tilley met with it in a woman of twenty-two, and W. R. H. Stewart reported another case in a female aged twenty-three.

These facts relative to sex and age assume even greater interest when we study the incidence of cancer in those parts of the alimentary canal which lie immediately above and below the œsophagus and in the contiguous larynx. Malignant disease of *the tongue, fauces and oro-pharynx* is more common in men. The statistics of the Ear and Throat Department during the last six years furnish the following figures: Of 49 cases of malignancy in these situations, 44, or 89 per cent., were males, while 5, or 10 per cent., were females. The average age of the men was fifty-seven and of the women forty-seven years.

Malignant disease of *the stomach* affects men more frequently than women. Welch, of Baltimore, gives the proportion as five to four. Robson and Moynihan met with the disease in 36 men and in 23 women during ten years in the Leeds Infirmary. Osler, in 150 cases of cancer of the stomach, observed it in 126 males and in only 24 females. In the recently published statistics of the Mayo Clinic, 88 of the patients were men and 38 were women. In Robson and Moynihan's cases the age-incidence generally was from forty to sixty years, while in the Mayo's cases the average age in the males was fifty-two and in the females forty-nine years.

James Langwill has investigated 200 cases of cancer of the stomach occurring in the practice of Professor F. M. Caird (*Edinburgh Medical Journal*, March, 1913). The males numbered 122 and the females 78. The writer comments upon the proportionately large number of women affected. The majority of the cases occurred between the ages of forty and sixty, especially, however, between fifty and sixty.

The greater frequency of malignant disease of the *larynx* in men is a well-established fact, and a comparative study of my laryngeal and œsophageal cases during the last eleven years illustrates this point.

TABLE IV.

Malignant disease of larynx, 55 cases.		Malignant disease of œsophagus, 68 cases.	
Males	. 47, or 85 per cent.	Males	. 26, or 38 per cent.
Females	. 8, or 14 „	Females	. 42, or 61 „

The next table shows the age-incidence of the laryngeal disease in the two sexes.

TABLE V.

Decade.	Males.	Females.
21-30	0	1
31-40	0	0
41-50	7	3
51-60	19	1
61-70	15	2
71-80	6	0

In one of the women the age was not recorded. The average age-incidence in the men was therefore fifty-nine years, and in the women fifty-one years. While the age-incidence in the males suffering from laryngeal carcinoma is much the same as that in malignant disease of the œsophagus, fifty-nine and fifty-seven years respectively, in the women the average age is higher in laryngeal than in œsophageal tumour—fifty-one years as compared with forty-five years. The number of women in the series, however, is very small.

In connection with a comparative study of this kind, it is important to determine, if possible, between primary intrinsic and primary extrinsic laryngeal cancer in view of the frequency of malignant disease in the post-cricoid region in women. It would be natural to expect that extrinsic laryngeal cancer would occur more frequently in them than in men. There is considerable difficulty, however, in determining this point, because it may be impossible to say on inspection where the disease commenced in those cases in which both the intrinsic and extrinsic laryngeal structures are involved. A carefully ascertained history of the sequence of the symptoms is of assistance in some, if not in all, of the cases. So far as I have been able to elucidate this point, in all probability of the 47 cases of laryngeal carcinoma in men, 20 were intrinsic and 27 extrinsic in origin; whereas, in the 8 women, 5 were intrinsic and 3 extrinsic. So far as these figures may be regarded as of any value, they do not furnish evidence that in women there is a greater tendency to primary extrinsic laryngeal carcinoma.

All these facts relative to sex and age in malignant disease of the œsophagus are in themselves of considerable interest, and when examined in conjunction with cancer of the adjacent parts of the alimentary canal and with the same disease in the larynx it is difficult to find an explanation of its more frequent occurrence in women, and at an earlier age, than in men. If irritation is to be regarded as an ætiological factor it is more natural to look for such in the male sex. Excess of stimulants, imperfectly masticated and hurriedly swallowed food may be justly regarded as more frequent causes of irritation in the male sex. It would, however, be interesting to investigate the influence of hot tea as a possible source of irritation in women.

The question of the existence of an hereditary influence was only investigated in a limited number of the cases, often owing to a natural hesitation in asking such a leading question. The case histories show that an inquiry was made into the family history in nineteen instances, and that the following facts were ascertained: In nine, that is, in practically 50 per cent. of the cases which were inquired into, a history of malignancy was obtained. The details are as follows: In two, one of the parents, a father and a mother respectively, died with cancer of the œsophagus; in one a brother had a malignant tumour in the throat; in one the mother died from cancer of the stomach; in two the mother had cancer of the breast, and in one of these cases, in addition, a brother had a malignant tumour of the neck; in one the father had a malignant abdominal tumour. In the two remaining cases, a cousin had malignant disease in one of them, and in the other an aunt and cousin died of cancer, while the mother of this patient also had an abdominal swelling, which was regarded as probably of a malignant nature. In ten of the nineteen patients no family history of malignant disease was obtained, but in two of them there was a bad tubercular history. In three cases, all of them men, there was a very definite alcoholic history.

In almost every case the occupation of the patient and the district in which he lived were ascertained. As regards the women, with the exception of a governess, a lady's companion and a professional nurse, we find that the majority of the others lived at home following no occupation, while a few were domestic servants. The men followed various callings: business men, blacksmiths, miners, carters, joiners, shoemakers and general labourers.

As might be expected in statistics, from a centre like Edinburgh, the patients were drawn from various districts. The

majority lived in the city and in the neighbouring Lothians—27 in all. Next in frequency, Fife provided 10, with 2 from the adjacent county of Clackmannan. The remainder were derived from the eastern and south-eastern counties of Scotland, Aberdeenshire (3), Elgin (1), Forfar (2), Berwickshire (3), Roxburghshire (3), Selkirk and Peebles (2). Perthshire accounted for 5, Lanark for 2 and Dumfries 1, while 3 came from the north of England and 1 from the north of Ireland. Three were unaccounted for. The difficulty, however, in attaching any importance to residence lies in the fact that some of the patients at any rate had only lived temporarily in the locality assigned to them.

This part of the subject, however, is one that touches upon the general pathology of carcinoma, and we are not prepared to do more than merely state the above facts. The fresh figures which have been brought forward in connection with the œsophagus and those recently published by Langwill in connection with the stomach point to the increasing frequency of cancer in women in these organs, with regard to which earlier statistics had shown that the majority of the cases occurred in the male sex.

Duration of the Disease.—In studying the duration of the symptoms in these cases, the influence of sex and age along with the situation of the growth has been considered. A very considerable variation is met with. In some of the cases the history obtained from the patient gives misleading information as to the probable length of time that the disease has existed. This is due to the fact that in some instances he suddenly becomes conscious of obstruction in swallowing. This may follow immediately upon the sensation of a bone sticking in the throat, or a piece of meat may unexpectedly lodge in the gullet. Prior to these accidents the patient may have been quite unconscious of any abnormal sensations in reference to his deglutition. In these cases a condition of acute obstruction arises comparable to that met with in carcinoma of the rectum, the patient living in apparent health while the disease has been slowly progressing towards a fatal termination. After this onset difficulty in swallowing remains permanently as a symptom of a gradually progressive character. In the few cases of this kind which we have met with the duration of the symptoms covers a very short period, and this fact may make us sceptical about regarding the condition as malignant. As an illustration of this type the following case may be briefly quoted :

J. P—, male, aged forty-seven, without any previous difficulty in swallowing.

complained that twenty-four hours before his examination a piece of meat "stuck in his throat," and that he had not been able to swallow anything since. The laryngoscope revealed nothing abnormal. Œsophagoscopy was carried out under local anæsthesia. The tube passed easily through the upper end of the œsophagus, and as it approached the cardiac end an irregular dirty-looking papillomatous area, about an inch and a half long in its vertical diameter, was seen to occupy mainly the right side of the gullet and narrow its lumen. A distinct fœtor could be detected rising through the tube. From the appearance presented it was obviously of a malignant nature, and from the extent of the area affected it had probably existed for a considerable period of time.

The next case also illustrates in a striking manner the absence of symptoms referable to deglutition even when the disease is well advanced.

Miss W——, aged forty-five, one week before examination complained that a fish-bone had stuck in her throat. Since then she had not been able to swallow solid food, and even fluids passed with difficulty. She had recently become much thinner. One of her brothers had died of malignant disease of the throat. Laryngoscopy revealed a white, fungating mass lying across the lumen of the hypo-pharynx and projecting upwards behind the arytenoids, and probably attached to the posterior wall of the pharynx, as the arytenoid cartilages moved freely on phonation and the larynx appeared to be free from any infiltration. Œsophagoscopy under local anæsthesia was not very satisfactory, but the mucous membrane covering the posterior surface of the cricoid cartilage showed evidence of infiltration. There was an enlarged hard gland in the left anterior triangle of the neck. The patient died a few months later.

When a history is given of a bone sticking in the throat followed by difficulty in swallowing, a careful examination for malignant disease should not be neglected.

In addition to the two cases just quoted, three other patients gave a history of symptoms of two, four, and six weeks respectively, thus further illustrating the short duration of the symptoms in some cases of malignant disease of the œsophagus.

In the great majority, however, we meet with a different type of case, and in a considerable number of them difficulty in swallowing extends over so long a period without any other symptom developing that for this reason, again, doubt may be thrown upon the existence of malignant disease. The patient may be conscious of a choking sensation when eating, especially when meat or bread is swallowed, and as this recurs, often at every meal, these articles of diet are given up, usually from a sense of fear that something untoward may occur. Again, we obtain the history that for a considerable period of time the eating of a meal has become a much slower process than it used to be, and solid food requires to be more carefully masticated than formerly, while later a forcing effort is necessary before the food passes beyond the upper end of

the gullet. Finally, solids can no longer be swallowed in spite of deliberate mastication and due care. Soft, pulpy food is then tried for a time, and finally the patient may present himself for examination able only to swallow fluids, and even they may give rise to difficulty.

The period of time during which these symptoms are complained of varies from a few months to several years, and a few examples may be quoted as illustrations.

A. T —, aged seventy-one, female. Presented herself for examination in the autumn of 1911. She first noticed difficulty in deglutition six months previously. An increasing difficulty in swallowing solids gradually supervened, and when she came under observation she could only take fluids. She was considerably emaciated. No enlarged lymphatic glands were felt in the neck, but palpation revealed a slight fulness of the thyroid gland. On laryngoscopy the right vocal cord was found to present defective abductor movement. Œsophagoscopy was carried out, and when the œsophagus was reached a greyish, slightly irregular infiltration, readily bleeding, was observed upon the posterior wall of the tube. The anterior wall appeared to be healthy. A small piece of tissue was removed with forceps. Microscopic examination demonstrated well-marked ingrowths of epithelium in the deeper tissues, and a diagnosis of squamous epithelioma was made.

Mrs. V —, aged forty-four, was examined in October, 1909. She gave a history of difficulty in swallowing extending over a period of eight years. Two years after the onset of this symptom—that is, six years before my examination—a gastrostomy was performed by the late Professor Annandale, but the patient, becoming weary of this method of obtaining nourishment, removed the tube from her stomach at the end of two months. The difficulty in swallowing remained much the same until five months before her examination, when it became considerably worse. She now experienced slight pain on swallowing, and had become much emaciated. A faint stridor was also noticed on inspiration. An enlarged lymphatic gland could be palpated on the left side of the neck, and slight fulness of the thyroid gland was noticeable. Laryngoscopy revealed a considerable quantity of secretion lying behind the arytenoids, and on the left side in this region an infiltration covered with a slough occupied the posterior pharyngeal wall. Both arytenoids were swollen, the swelling being of a reddish colour and evidently of firmer consistence than that produced merely by oedema. There was no obvious ulceration. The movements of both vocal cords were somewhat restricted. Œsophagoscopy demonstrated behind the cricoid cartilage the lumen of the tube narrowed by infiltration, presenting an uneven, ulcerated surface, which bled very readily. The patient refused a second gastrostomy, and died very shortly afterwards.

Mrs. F —, aged forty-six, was first examined in August, 1904. She then stated that she had been unable to swallow meat for twenty years. Soft foods and bread were readily swallowed, but even this form of diet frequently caused her pain in the neck. There were, however, periods when deglutition was quite normal. She used to suffer a good deal from indigestion, and four years before the above date the stomach-tube had been passed. She had recently had œsophageal bougies passed by a surgeon, who seems to have regarded the condition as "functional" and probably related to the menopause. Her father had died with an abdominal tumour. Laryngoscopy revealed nothing abnormal.

There was no swelling in the hypo-pharynx; no paresis of the vocal cords. There was no enlargement of the lingual tonsil, and no enlarged glands were found in the neck. As bougies had been recently passed they were not again employed.

About four and a half years later (December, 1908) I again saw the patient. During the previous six months deglutition had become much more difficult. Even liquids were swallowed with difficulty, because they induced fits of coughing. The pain was often very severe, shooting up to the left ear. Stridor had been noticed during the previous week while she slept. The patient had become much emaciated. Enlarged hard glands could be felt in the right side of the neck, and there was a distinct broadening of the thyroid cartilage. The left arytenoid was oedematous, and the left vocal cord was fixed close to the median line. The right arytenoid was normal in outline, but the movement of the right vocal cord was impaired. It was evident that the disease had secondarily involved the larynx, and the question of tracheotomy was considered. During the next forty-eight hours, however, pneumonia developed, and the patient died a few days later.

These cases sufficiently illustrate the prolonged period over which symptoms produced by undoubted malignant disease of the œsophagus may continue. An analysis of the series of sixty-eight cases brings out the interesting fact that in 22, or 32 per cent., difficulty in swallowing was complained of for one or more years, and further, that in nineteen of them the patients were women. There is a natural tendency, therefore, to regard some of these cases as "functional." A diagnosis of this kind cannot be too emphatically condemned, and no case of difficulty in swallowing should be classified as such until a careful examination with the œsophagoscope has been made. Even then, if nothing abnormal is discovered, the patient should be re-examined at intervals, because even after the lapse of some years she may die with malignant disease of the gullet. If we except the five cases already referred to in which the symptoms complained of had been observed from a few days to six weeks, we find that the average duration amongst men was six months, and that in only three instances had the patient noted any abnormal condition for a period of one year or more, namely, one, one and a half, and three years respectively. Amongst the women, on the other hand, the average duration of symptoms extended to a period of three and a half years, due partly to the fact that in nineteen of them symptoms had been observed for a number of years. The actual figures may be grouped as follows: Seven had noticed symptoms from one to four years, five from six to twelve years, five for several years, one for twenty years, and one for thirty years. The inclusion of the two last cases, which must be regarded as exceptional, is partly

responsible for increasing the average duration period of the symptoms in women. If they are excluded, the average period is reduced from three and a half to two and a half years.

The following table illustrates the average duration of the disease in the two sexes in the different decades.

TABLE VI.

Decade.	Males.	Females.
31-40	Av. duration 1 month	Av. 2 years
41-50	„ 6½ months	3 years, 4 months.
51-60	„ 6 „	5 years.
61-70	„ 8½ „	No case.
71-80	„ 12 „	6 months (one case).

The disease therefore progresses more slowly the older the individual, and it is more slowly progressive in women than in men. Owing to the small number of cases of tumour of the lower end of the œsophagus, no general conclusions should be drawn as to the relative duration of the disease in the three different situations. Table VII, however, gives the average period in the series.

TABLE VII.

Hypo-pharynx.	Upper end.	Lower end.
1 year, 5 months	3 years, 6 months	8 months.

An attempt has been made to obtain some idea as to the probable expectation of life after the diagnosis has been made by calculating the time which elapsed between the date of examination and the fatal termination. The actual date of death was ascertained in thirty-four cases. In three of them gastrostomy had been performed. In the remaining thirty-one no surgical interference was carried out. On an average death supervened in them in three months after the examination. Life was prolonged for only a few weeks in several of the cases, and in a number of the others for five, six, seven or even eight months. In two of the cases in which gastrostomy was performed death occurred within a few days of the operation, and the third terminated fatally after four months.

It is not easy to arrive at an explanation of the great variability met with in the duration of the symptoms in this class of case. It is a well-known fact that so long as the tumour is confined within the walls of the œsophagus its progress is slow, but once it passes beyond the confines of the tube and invades the surrounding tissues a rapid development usually takes place. Even when

PLATE I.

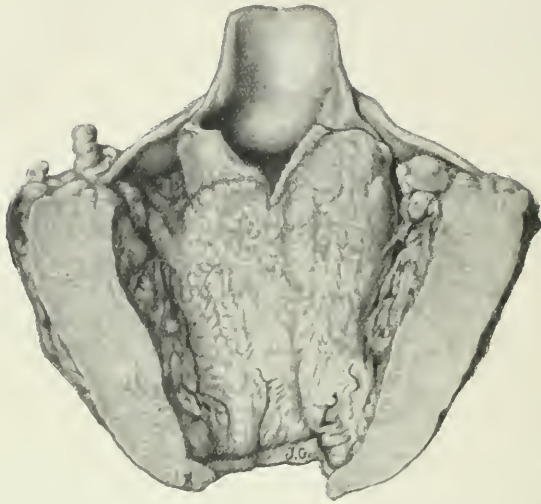


FIG. 1.—Squamous epithelioma of the oesophagus and hypo-pharynx from a woman, aged forty-eight. Duration of symptoms, seven years.



FIG. 2.—Squamous epithelioma of upper end of oesophagus from a woman, aged fifty-eight. Duration of symptoms six months. (a) Disease lying outside oesophagus with right recurrent laryngeal nerve passing into it; (b) right recurrent laryngeal nerve; (c) enlarged lymphatic glands.

confined to the œsophagus, however, remarkable variations in its duration are met with. An explanation is to be found in our inability to fix the approximate date at which the disease probably commenced. It is true that malignant tumours differing in structure show a varying rate of growth, but in the œsophagus we have to deal mainly with one type of tumour, and that is the squamous-celled epithelioma, which, according to Butlin, forms 90 per cent. of the cases. There is undoubtedly a great difference in the life-history of similar types of tumour growing in different parts of the body, and there is also a marked difference in the course of tumours of like structure arising in the same part of the body and under apparently similar conditions. It is probably in this fundamental fact that an explanation is to be found of the great variations in the duration of cancer of the œsophagus. The two following cases, examples of squamous-celled epithelioma, offer a marked contrast in their clinical history, and are quoted here in illustration of this point.

Fig. 1, Plate I, is a specimen of squamous-celled carcinoma involving the hyp-pharynx, which was removed along with the larynx by Professor Alexis Thomson from a woman, aged forty-eight. She complained of increasing difficulty and pain in swallowing, symptoms which had first manifested themselves *seven years* before examination. There was no history of an injury. Three and a half years before the operation she had consulted a surgeon, who diagnosed a slight stricture of the œsophagus, and the systematic employment of bougies for a time was followed by beneficial results. She had become much thinner, losing a good deal in weight. The accompanying illustration shows the distribution of the tumour, involving the walls of the lowest part of the pharynx and the commencement of the œsophagus, and spreading round the entire lumen of the tube. The vertical extent of the disease measures 2 in. The main mass of the growth lies posteriorly, and has a diameter of 12 mm. in its thickest part. Its general surface is ulcerated; the narrowest portion of the constriction is situated at the lowest part, where the lumen is reduced to 10 mm. Microscopic examination showed the growth to be a typical squamous-celled epithelioma, infiltrating both the sub-mucous and muscular coats.

Fig. 2, Plate I, is the œsophagus obtained *post-mortem* from a woman, aged fifty-eight. She had complained of great difficulty and pain in swallowing, the symptoms being first noticed *four months* before she presented herself for examination. During this period she had become much emaciated, and had lost 2 st. in weight. A chain of enlarged glands could be palpated on each side of the neck, especially noticeable on the right side. An œsophageal bougie localised the stricture at the upper end of the gullet. She refused gastrostomy, and becoming rapidly worse, died two months later. The whole course of the disease as recognised clinically was of six months' duration. The stricture is seen at the upper end of the œsophagus, its superior margin lying 1 in. below the mouth of the gullet. It measures 1 in. vertically, and its lumen only admits a fine quill with a diameter of 2 to 3 mm. The disease involves the whole circumference of the tube, and is thickest posteriorly, where it measures $\frac{1}{4}$ in. On the right side the growth

has extended beyond the wall of the œsophagus, and forms a small mass of dense, firm tissue lying behind the right common carotid artery. A chain of enlarged glands lies in the interval between the gullet and the trachea, partially concealed by the right common carotid artery. The highest gland in the chain is adherent to the extension of the growth described above. The right recurrent laryngeal nerve passes through and is involved in the tumour mass lying outside the œsophageal wall. The microscope demonstrated the growth to be a squamous-celled epithelioma. In all probability the early formation of a very tight stricture in this case led to the rapid malnutrition of the patient.

In all probability a more general and an earlier use of the œsophagoscope will lead to more accurate knowledge regarding the initial stages of carcinoma of the œsophagus.

ADDITIONAL CLINICAL PHENOMENA.

While we have dealt at some length with such questions as the sex, the age-incidence, the mode of onset, and the duration of the disease in cases of carcinoma of the œsophagus, the clinical picture would not be complete without reference to certain further points of considerable importance. In connection with the act of deglutition the patient is occasionally conscious of a *gurgling sound* as the food passes behind the larynx, and it is easy to demonstrate this by asking him to swallow a few mouthfuls of water. In these cases the stricture is probably a narrow one, and the disease is far advanced, because where this symptom was easily recognised it was found impervious to a very small bougie, and death took place within a very short period, namely, in from two to three months.

The *regurgitation* of food is sometimes complained of, and as we have found this in more than one instance associated with the gurgling of fluids it is probably due also to the narrowness of the stricture.

Many of these patients are made very uncomfortable by the *accumulation of mucous secretion* in the lower part of the pharynx. The quantity of mucus that is brought up varies considerably. It may or may not be at times tinged with blood. The *presence of blood* is by no means a common occurrence; indeed it has proved to be distinctly an exceptional sign in the cases now under review. The excess of secretion in the lowest part of the pharynx is often demonstrable when laryngoscopy is carried out, a point to which further reference will be made when the physical examination of the patient is discussed.

The occurrence of *pain*, usually a dysphagia, is a symptom which must be considered. In some cases it is a prominent one,

PLATE II.

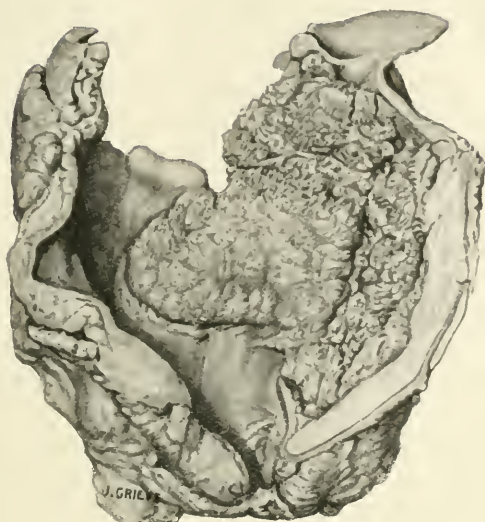


FIG. 1.—Squamous epithelioma involving mouth of œsophagus mainly on the right side also the hypo-pharynx and right ary-epiglottidean fold, and sinus pyriformis.

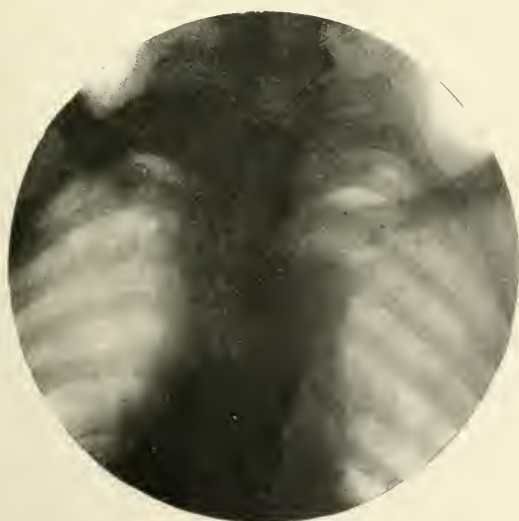


FIG. 2.—Squamous epithelioma of upper end of œsophagus. Radiogram showing bismuth at site of stricture. Man, aged seventy.

while in others it may be absent throughout the whole course of the disease, and for that reason doubt has been thrown upon the probable malignant character of the stricture. The presence or absence of pain was inquired into in forty-one of the cases, and it was found to exist in thirty-four, while in seven the patients definitely stated that they were quite free from any discomfort of this kind. It should be noted, however, that dysphagia, though absent in the earlier stages of the disease, may supervene before the fatal termination. Dysphagia was present most frequently where the disease affected the hypo-pharynx, being noted in eighteen of the cases in which the tumour occupied that region. In the remaining eight the history is defective on this point. As a rule the pain is referred to the site of the obstruction. In twelve instances it was also referred to one or both ears.

A prominent and often a rapidly progressive feature in these cases is the *emaciation* which is observed in so many of them. The case-histories record it in forty-five instances. Two patients denied any loss in weight, but in both of them emaciation became very obvious towards the termination of the disease. Its absence in the earlier stages, however, should not lead to an error in diagnosis.

Cough was occasionally a troublesome symptom. In one case severe spasms of coughing were the first, and, for a few months, the only symptom for which the patient sought advice.

Hoarseness or some alteration in the character of the voice occurs either as the result of involvement of one of the recurrent laryngeal nerves or from direct invasion of the larynx by the disease. The recurrent nerve may become implicated in the tumour when the latter has found its way through the walls of the œsophagus, as has been described on Fig. 2, Pl. I, or it may be pressed upon by secondarily enlarged glands. When the tumour, originating in the hypo-pharynx, involves the framework of the larynx, and causes impaired mobility or fixation of one or both vocal cords, hoarseness of voice follows. It is in this class of case, too, that difficulty in breathing may arise sometimes of such a nature as to make tracheotomy necessary, while pressure of the growth upon the trachea may lead to a similar result.

The proportion of cases in which hoarseness was present at the time of examination was not large, being noted in only seventeen patients, while in eight instances some interference with normal laryngeal respiration was also observed. The history of several of the other cases, however, subsequent to the making of the examina-

tion, showed that laryngeal symptoms developed at a later date, and that tracheotomy was sometimes necessary before death.

PHYSICAL EXAMINATION OF THE PATIENT.

Enlarged Cervical Glands.—The existence of secondarily enlarged glands in the neck was noted in a number of cases, but the case records are somewhat defective in connection with this point. In the twenty-six cases in which the tumour was classified as being in the hypo-pharynx, enlarged glands were palpable in eighteen and were absent in three, while in the remaining five no statement was made regarding them. In the thirty-six cases grouped under upper end of œsophagus, enlarged glands were observed in eleven, while in eight it was definitely stated that there was no enlargement. In the remaining seventeen the record omitted any statement upon this point. It is reasonable to suppose that when the tumour is situated higher up in the region of the hypo-pharynx that the glands are more easily demonstrable, but it must not be assumed on that account that they are more frequently enlarged than in those cases in which the tumour occupies a lower position in the œsophagus. The dissection of the specimen shown on Fig. 2, Pl. I, demonstrated the concealed position of the chain of enlarged glands behind the common carotid artery and at a lower level, too, behind the subclavian artery.

Laryngoscopy.—This is an essential part of the clinical examination in every instance, and it should always be carried out before proceeding to an examination with the œsophagoscope. One may recognise an accumulation of secretion behind the arytaenoids in the lowest part of the pharynx, an appearance to which considerable significance should be attached when disease is suspected at the upper end of the œsophagus. In some cases its removal may actually reveal the existence of the disease in the hypo-pharynx by the presence of a slough or actually as an area of œdema or infiltration of the underlying mucous membrane.

An analysis of the laryngoscopic appearances met with in this series of cases gives a number of interesting facts, all of which have reference to disease at the upper end of the œsophagus, the laryngoscopic picture being normal in the six cases in which the lower end was affected. The existence of abnormal secretion behind the arytaenoids was observed in thirteen of the cases. Actual changes were observed in the mirror in forty-three, that is, in 63 per cent. of the cases. This is a large percentage, and indicates the value of laryngoscopy as an aid in diagnosis. Inter-

ference in the mobility of the vocal cords was noted in 22, or in 32 per cent. of the cases. Paralysis of one cord from involvement of the nerve in the tumour-growth or from enlarged glands was present in thirteen cases, the right vocal cord being affected in four, in all of which there was faulty abduction; the left vocal cord was affected in nine instances, there being faulty abduction in two and complete recurrent paralysis in seven of them. In the remaining nine cases one or other vocal cord was immobile, the fixation being due to infiltration of the crico-arytænoid region by the tumour and not to paralysis. Here the right vocal cord was found fixed in five and the left in four of them.

The other changes observed on laryngoscopy were mainly of the nature of tumour infiltration of the hypo-pharynx with or without secondary involvement of the posterior laryngeal wall. This was evident in thirty cases, in the twenty-six classified as hypo-pharyngeal, and in four in which the tumour involved the upper end. I do not propose to describe the appearances observed in each case; it will suffice to give a general description of what was seen. In all the cases which have been classified as malignant disease of the hypo-pharynx part of the tumour was visible in the laryngoscopic mirror. Occasionally a grey or yellowish-grey slough may be detected partially concealing a slight infiltration of the lowest visible part of the posterior pharyngeal wall; a small ulcerated area may be observed at the edge of the slough. In one case a slight fulness of the mucosa covering the posterior wall of the pharynx immediately behind the arytaenoids was the only visible pathological change at the first examination. The commonest picture was that of an ulcerated infiltration lying across the deepest part of the posterior pharyngeal wall as an elevated area behind the arytaenoid cartilages. Sometimes no ulceration was visible. The infiltration may be seen to extend on to one or other lateral wall of the pharynx and into the pyriform sinus. In one case the small swelling confined to the posterior pharyngeal wall presented a distinctly fungating appearance, while in another a red non-ulcerated mass occupied the same region. If the patient be directed to phonate, normal movement of the vocal cords and arytaenoid cartilages may be observed. More commonly, however, the posterior laryngeal wall had become involved in the tumour growth, so that the laryngoscopic picture presented a still more varied appearance. In addition to the pharyngeal changes already described, one or both arytaenoid regions were found swollen, sometimes the appearance suggesting merely an

œdema of the mucous membrane, while in others there was obviously tumour infiltration of these areas, perhaps ulcerated and even creeping up on to one or both ary-epiglottic fold. Figs. 1, Pls. I and II illustrate *post-mortem* the distribution of the disease in two cases of post-cricoid carcinoma.

In those cases in which the disease is situated in the upper end of the œsophagus, or, if also involving the lowest part of the hypo-pharynx, but not yet visible in the laryngoscopic mirror, there is very little departure from the normal to be noted by this method of examination. If any change exist, it is usually of the nature of a vocal cord paralysis. In four of the cases in this group, however, in addition to the paralysis, a slight œdema of one ary-tæmoid region was observed, but in no instance could the tumour be detected with the laryngoscope.

The Use of Bougies.—There is at the present time a natural and increasing objection to the passage of the œsophageal bougie as a means of diagnosis in the detection of stricture. When the clinical history points to obstruction of the gullet it is difficult to see what further advantage can be derived from the introduction of this instrument. It will in some cases enable us to say that the obstruction is situated at so many inches or centimetres from the incisor teeth, but that is all. It gives no information as to its cause. It is impossible to learn in this way the nature of the stricture, whether fibrous or malignant, or as to whether it is the result of narrowing of the tube from pressure upon its walls due to aneurysm or malignant disease in the mediastinum. Moreover, the bougie is not free from danger, and fatal accidents have followed its introduction. The instrument may be forced through the ulcerating base of a malignant tumour and death result from perforation of the gullet.

On the other hand, the bougie may have a limited use as a therapeutic agent in some cases after the œsophagus has been carefully inspected through the œsophagoscope and the exact nature of the obstruction has been ascertained.

The X Rays.—In order to obtain information regarding the position and the length of the stricture a much safer and wiser procedure is to examine the patient by means of the Röntgen rays. Not only is it possible to ascertain these facts by means of bismuth porridge and the fluorescent screen, but we may determine at the same time whether the cause of the obstruction is to be found in the walls of the œsophagus itself, or whether it is the result of compression of the tube from some pathological condition of the

neighbouring structures. It is of course not suggested that a diagnosis of malignant stricture can be made by this means. Although accidents have been recorded even by this method of examination, they are rare, and the information to be derived from it is more valuable and is obtained with much less discomfort to the patient than by the passage of a bougie. Fig. 2, Plate II is an X-ray picture of a case of stricture of the upper end of the œsophagus, the malignant nature of which was later confirmed by the removal of a portion of the growth by the aid of œsophagoscopy. An accumulation of bismuth is seen above the strictured portion of the gullet, while some of it is finding its way through the narrowed lumen.

Œsophagoscopy.—If an exact diagnosis of the true nature of the stricture cannot be made in every case by means of the œsophagoscope, it is safe to say that in the great majority of cases the malignant character of the disease can be ascertained in this way. By œsophagoscopy we not only ascertain the nature and the position of the stricture, but we learn whether the growth has involved the whole circumference of the gullet or whether it is limited to a portion of the wall. It may not be possible to ascertain the vertical extent of the disease in this way, because the stricture may not permit of the passage of the œsophageal tube through it. To even attempt to do so is in some cases not justifiable. If, however, an X-ray examination is also employed, information is then got regarding the length of the stricture. By a combination of the two methods of examination we thus obtain all the information possible, and in this way not only is a diagnosis arrived at, but full consideration can then be given to the question of attempting the removal of the strictured portion by œsophagectomy.

It is not my intention to describe here the technique of œsophagoscopy. For information on this point the reader is referred to a recent paper written in conjunction with Dr. J. S. Fraser and published in the *Edinburgh Medical Journal* for January and February, 1913, or to the general literature dealing with this subject.

Carcinoma of the gullet varies in its appearance when observed through the œsophagoscope, and while in some cases it can be at once recognised, in others the diagnosis cannot be so readily made, and a second or even a third examination may be necessary at short intervals, because an early recognition of these cases of malignant disease at the upper end of the œsophagus is very necessary if any success is to be obtained by surgical interference. Twenty-four of

the cases in the series were submitted to this method of examination. Œsophagoscopy was not employed in the twenty-six cases classified as hypo-pharyngeal, because in all of them the diagnosis was confirmed with the laryngoscopic mirror, and I am of the opinion that when this is possible, the patient should not be subjected to the introduction of the tube. The remaining eighteen cases came under observation before this method of examination became a routine measure.

When the appearance presented by the disease does not permit of a definite diagnosis being arrived at, an attempt is made to remove by forceps a small portion of the suspected tissue for purposes of microscopic examination. This was done in a number of cases with a positive result, and the diagnosis of epithelioma was confirmed. On the other hand, it is necessary to point out that sometimes the microscope reveals no evidence of malignancy, although proof of the malignant nature of the disease is later obtained. The forceps may not penetrate the tissue sufficiently to permit of any ingrowth of epithelium being observed in the portion removed. In some cases again it is not possible to obtain a piece of the growth on account of the absence of any projecting surface.

CONCLUSIONS.

1. Carcinoma of the upper end of the œsophagus is more common in women than in men.
2. It occurs in women at an earlier age than it does in men.
3. Carcinoma invades the hypo-pharynx more frequently in women than in men.
4. The average duration of the disease is longer in women than in men.
5. The disease follows a more protracted course in the older than in the younger patients.
6. The average duration of the disease is shorter when the hypo-pharynx is involved than when it is limited to the upper end of the œsophagus.
7. Laryngoscopy is an essential part of the examination in all cases of suspected carcinoma of the œsophagus.
8. Œsophageal bougies should not be employed as a method of diagnosing stricture.
9. A combination of X-rays and œsophagoscopy furnishes the most complete information regarding the nature of the disease, its situation, and the length of the gullet involved.

10. When a piece of the suspected tissue is removed for microscopic examination and no evidence of carcinoma is found, the existence of a simple stricture must not be inferred.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE.—OTOLOGICAL SECTION.

February 21, 1913.

DR. J. DUNDAS GRANT, *President of the Section, in the Chair.*

An Examination of both Temporal Bones from 120 Individuals, made with the View of Deciding the Question of Symmetry.—**Arthur H. Cheatele, F.R.C.S.**—Mr. CHEATELE showed lantern-slides of some of the more interesting points. Symmetry was present in eighty-two, and asymmetry more or less marked in thirty-eight. The diploëtic infantile type, which is so important in suppuration, was present in forty-four, in twenty-four on both sides, and in twenty on one side only; of these twenty, seven were so asymmetrical as to affect the course of suppuration and X-ray photography, that is to say, that the diploëtic type which would give a dark shadow was present on one side, and a cellular mastoid on the other. Marked symmetry of the mastoid cells was shown in several sets. The extension of cells into the digastric fossa sometimes caused a "digastric bulla" on one side only, or unilateral extension into the occipital bone caused an "occipital bulla." The lateral sinus and sulcus jugularis were larger on the left side in thirty-two sets.

The PRESIDENT (DR. DUNDAS GRANT) said that Mr. Cheatele had shown that though the chances were in favour of symmetry, on the whole the exceptions were also very numerous.

Osteoma of the Mastoid.—**E. B. Waggett, M.B., and E. D. Davis, F.R.C.S.**—A case similar to that exhibited at the November meeting. A woman, aged thirty-six, complaining of deafness of four months' duration, had discovered the presence of the tumour accidentally. A hard hemispherical tumour the size of a bantam's egg projected behind the ear in the antral region, and also obstructed the meatus. Obstructive deafness. Operation: Skin incision following contour of growth. Hugh Jones's meatal flap. The tumour proved to be sharply defined from the normal outer table by a groove. As the position of the lateral sinus could not be made out in the skiagram, a trench was carefully cut with the electric burr until mastoid cells and normal diploë were exposed at all points, when a few taps of the chisel brought the tumour away. Its inner aspect proved to be well defined, and the tumour, which measured 1 in. by 1 in. by $\frac{5}{8}$ in., a flattened ovoid, and consisted throughout of dense bone. After the removal of wax, the drum-head was seen to be normal, and the mastoid process to be of the pneumatic type with a large antrum separated by a shell of bone from the sinus; all mastoid cells were

removed, and in lining the large cavity created Hugh Jones's flap was found very convenient to manipulate owing to its long and flexible pedicle. It was suggested that the flap might with advantage be split longitudinally in order to furnish eight growing epithelial edges.

Mr. CHEATLE said in order to make the X-ray picture of the temporal bone easier to interpret, the external auditory meatus should be filled with bismuth paste.

Mr. JENKINS asked whether the osteoma was entirely within the mastoid, and not reaching the surface, either through the meatus or externally.

Dr. URBAN PRITCHARD said he had encountered two instances of the condition. One was a specimen which Mr. Harvey had; it was simply sawn off, and the bone proved to be very dense. The other patient had the condition symmetrically, and it had persisted twenty-five years without causing her trouble.

Mr. WAGGETT replied that it was an osteoma of the outer table, and projected like a chestnut at the back of the ear, and into the meatus, obstructing it.

A Periosteal Lining Flap in the Radical Mastoid Operation.
—P. Watson-Williams, M.D.—The skin incision extends from just above the highest point of attachment of the pinna, curving outwards and backwards, well within the margin of hairy scalp, curving forwards below to the mastoid tip. The skin and soft tissues, save only the periosteum, are dissected forwards to the margin of the bony meatus.

The periosteal incision divides the periosteum along the superior and posterior margins of the bony meatus, and is carried horizontally backwards from near the lowest point of the meatal incision, so that the whole of the mastoid periosteum, excepting that of the tip, may be reflected backwards and upwards.

After conclusion of the operation, after the meatal flap has been made, the periosteal flap is brought down over the upper and posterior wall of the resulting mastoid cavity, and retained *in situ* by the packing. With Körner's flap the packing lies between the periosteum and the flap. This method supplies the posterior and inner walls of the mastoid bone cavity with a periosteal covering, which quickly attaches itself to the bone and promotes rapid granulation over which the epithelium from the edges of the concho-meatal skin-flap extend rapidly. The more rapid formation of granulations lessens the size of the healing cavity, and thus decreases the area for epithelialisation.

The PRESIDENT said he presumed the flap speedily became covered with granulations. He would like to know whether Dr. Watson-Williams found that his method shortened the duration of after-treatment, or whether it diminished the size of the after-cavity without leaving the little recesses which gave so much trouble. It would be agreed that the desideratum was to come as near the results obtained with skin-grafts as possible. The only objection to the skin-graft was that it generally meant a second anæsthetic and operation.

Dr. URBAN PRITCHARD asked whether Dr. Watson-Williams considered that a covering of epithelium formed more quickly than if it were bare bone and ordinary granulations were left to form. He had always wanted to have a method of filling up the new cavity as much as possible; it would save much subsequent trouble.

Mr. CHEATLE said he believed the method had been anticipated by an American surgeon.

Dr. COGHLAN (Portland, U.S.A.) had never previously seen the flap now described by Dr. Watson-Williams, and did not know that it had been described in the States.

Mr. C. E. WEST considered the question of speed of healing was important. He could see that periosteum laid down in that way would take, because it was periosteal graft on bone. But his own experience of periosteum was that it was about the most obstinately granulating tissue in the body, and that it was difficult to get epithelium to spread over the granulating periosteum. Why not put a skin-graft on bone? It would adhere.

Mr. SYDNEY SCOTT said that during the last three years he had made use of a periosteal flap, but he had not regarded the procedure of any particular importance; it simply amounted to this, that instead of cutting away the periosteum, the periosteum covering the outer surface of the mastoid process was retained, and when packed into the operation cavity it helped to fill it up, so that less packing was required, and the skin-graft which was applied at the same time need not be quite so large.

Mr. CHARLES HEATH said the pericranial flat which he had devised, and used for many years in acute and chronic, radical or conservative operations, was a rather smaller one than that now depicted by Dr. Watson-Williams, the upper incision defining the flat being, like the lower one, horizontal. He (the speaker) had used such flaps in all cases since 1906, and if he had found any reason to vary it he would have done so long ago.

Dr. DAN MCKENZIE said he had used Mr. Heath's flap for a long time, and at the operation it looked very nice, but his own feeling was much in the same direction as Mr. West's, that it was very prolific of granulations; there seemed to be a tardiness of epithelialisation after a periosteal flap.

Mr. HUGH JONES said W. L. Ballenger laid stress on the retention of the periosteum, but he did not think that surgeon made any formal flap. He wondered what was the effect of that and similar procedures on the growth of bone. When cases operated upon years ago, in which, presumably, the periosteum was destroyed or removed, were opened up again, there was found to be lipping of the bone, and sometimes the cortex seemed to have grown over so as to almost obliterate the surface opening but leaving a large cavity within.

Mr. MARRIAGE, remarking on the President's statement that the objection to grafting was that it required a second anaesthetisation and operation, said that for years he had put the graft on at the time of the first operation; then there was no occasion to worry about the flaps, and the graft would take in every instance. Epithelialisation of the cavity occurred in three or four weeks, and that seemed the ideal method. He always used the graft which was first introduced by Mr. Ballance.

Dr. COGHLAN agreed with Mr. Marriage about the flaps, and in his part of the States all did primary skin-grafting, and with very good results. Some of his *confrères* in San Francisco had had some wonderful successes in such cases. Primary skin-grafting certainly seemed to be the best.

Dr. WATSON-WILLIAMS replied that some time elapsed before granulations sprang up on the bare bone of the mastoid cavity, but the periosteum attaches itself quickly to bone, its natural habitat, and the cavity then granulates up more quickly. In answer to the President, Dr. Watson-Williams said his impression was that the method shortened the period of healing. The grafting of the periosteum made the cavity

smaller, hence there was less space to fill up. Hence, even if the rate of epithelialisation were less, it would be compensated for by the smallness of the cavity to be covered. He had used the method for some years.

Otitic Abscess of the Pterygoid Region drained through the External Auditory Meatus; Recovery.—By DAN MCKENZIE, M.D.—The pterygoid abscess followed suppurative labyrinthitis with facial paralysis in a case of chronic suppuration of the middle ear.

Male, aged twenty, was admitted to hospital on August 21, 1912, with suppuration of the left ear and facial paralysis. History: Purulent discharge and deafness in the left ear of eighteen years' duration, attributed to scarlet fever. Some increase in the discharge during the last two weeks. Sudden appearance of facial paralysis five days before admission. Never any vertigo, nausea, or vomiting. Present condition: There is a large perforation in the postero inferior segment of the membrana tympani. No pain, tenderness, or swelling of the mastoid region. Hearing: Does not hear watch on contact. Weber lateralised to the right: Schwabach + 5; Rinne minus. No loss of high notes with Galton's whistle, but with Bárány's noise machine in the right ear the patient was unable to hear any sound in the left. Slight spontaneous nystagmus to both sides, but rather more marked to the right. August 22: Radical mastoid operation and labyrinthotomy. The mastoid antrum was small and deeply situated. Disease of the bone was found to be chiefly located in the region of the aqueductus Fallopii. A fistula was discovered in connection with the external semicircular canal. The fistulous opening was enlarged, the outer wall of the canal being broken down with the labyrinth chisel. Inferior vestibulotomy was then performed through the wall of the promontory.

After the operation the patient did not make good progress. Purulent discharge continued to flow from the ear, the auricle became inflamed, and the post-aural wound did not unite; in short, the operation area looked as if it had become septic. As time went on the local inflammation subsided, although the headache continued.

On September 21 lumbar puncture was performed, and 20 c.c. of clear cerebrospinal fluid was withdrawn. Next day the headache had disappeared, and as the other symptoms were moderating the patient was discharged, although he still continued to attend as an out-patient.

For a month the ear continued to discharge more or less, and on October 23 he complained of severe pain in the ear and head, with swelling of the face. There was marked oedema of the left side of the face affecting chiefly the temple and zygomatic region, and also the left cheek and orbit. He complained also of pain on eating, so severe that he was unable to masticate his food. On examination it was seen that the lower jaw was fixed in a half-open position. Attempts to open the mouth wider or to close it gave rise to much suffering. Pain was also felt on swallowing, and on inspecting the throat marked swelling and redness of the left tonsil and left side of the pharynx were observed. Temperature, 100.6° F. No rigors. A diagnosis of pterygoid abscess was made, and on October 24, under chloroform, the post-aural wound was reopened, the auricle being reflected well forward. The anterior wall of the osseous meatus was then exposed, and removed with a gouge in such a way as to form a window through it, deep to the temporo-mandibular articulation, and close to the tympanum. On removing the bone a considerable quantity of pus under pressure flowed into the meatus. After the evacuation of the abscess a probe was inserted into the cavity and passed down towards

the pharyngeal region, where its point could be felt with the finger in the mouth. The bone of the under surface of the petrous portion seemed to be bare. The cavity was packed with gauze and the auricle was replaced; but the post-aural wound was left open for drainage and inspection.

Intermittent fever continued for a week after the operation, and then the temperature fell to normal. The œdema of the face rapidly disappeared, and with it the stiffness of the jaw. Relief to the pain was experienced immediately after the operation. A few weeks later the cavities had closed and the ear had become epithelialised. The facial paralysis remains.

Otitic pterygoid abscess, or pharyngeal abscess as it is sometimes called, seems to be rare, as only some fifteen cases have been recorded. Most of these have been drained by pharyngeal incisions. As far as I have discovered the route successfully adopted in this case does not seem to have hitherto been tried. Attention is directed to the group of symptoms manifested by this patient, which was so characteristic as to lead to the correct diagnosis of the seat of the abscess.

MR. A. CHEATLE said he had been concerned with three instances of this trouble. The first was a specimen which he found *post-mortem*, in which there was an abscess lying behind the jaw, and a carious opening in the meatal wall, leading to the abscess. The patient was operated upon by his brother fifteen years ago, and death resulted from leptomeningitis and temporo-sphenoidal abscess. There was a definite hole in the meatal wall leading to the abscess cavity, and a rod was passed through it. The second case he operated upon, and it had much the same characteristics as Dr. McKenzie's; it was reported in the *Transactions of the old Otological Society*, vol. viii, p. 45. At the operation he found a labyrinthine sequestrum. The anterior meatal wall was replaced by a granulating hole, and his finger could pass through that into a big abscess-cavity behind the jaw to the tonsil. He did not drain the abscess through the pharynx, but put an aneurysm needle into the depth of the cavity, brought the point up into the neck, and made a counter-opening in a line with the anterior border of the mastoid process. The case did very well. The third case he saw in consultation, and there the trouble in the anterior meatal wall led to an abscess, which pointed into the pharynx, where it burst. Dr. McKenzie did not suggest how the pus got to where it did. He (Mr. Cheatle) suggested it got there by caries of the anterior meatal wall.

MR. SYDNEY SCOTT recalled having seen one example of suppuration in the region occupied by the pterygoid muscles on the right side, in a patient who died with Bezold's mastoiditis and a temporo-sphenoidal abscess on the same side.

MR. JENKINS asked whether Dr. McKenzie would adhere to the name pterygoid abscess, as that did not seem to be the situation of the suppuration in this case. He believed the abscess must have been situated external to and in front of the tympanic plate, and through the deep cervical fascia that passes up deep to the parotid gland to be attached to the vaginal process of the tympanic plate and spine of the sphenoid. This space defined by fascia reaches to the lateral wall of the pharynx, and so it is explained how Dr. McKenzie found the abscess reaching that region. The abscess would be deep to the parotid gland.

THE PRESIDENT asked what were the indications for opening the labyrinth in this case, seeing that there was an absence of vertigo, nausea, or vomiting.

DR. DAN MCKENZIE replied that he considered he was justified in

opening the labyrinth at the time, but since then he had not felt so clear about it. There had been deep-seated pain, facial paralysis, and total inability to hear with that ear as tested with the noise machine. It was because of the subsequent history of pterygoid abscess that he showed the case. With regard to that name, the abscess was a swelling which was interfering with the pterygoid muscles situated in what the anatomy books called the pterygoid region. No doubt the deep parotid region was involved, but to have called it "parotid abscess" would have given an impression which he did not wish to convey. It began in the ear and so could not be called "pharyngeal abscess." He proposed, therefore, to adhere to the name he had chosen. He was sure there was no caries or bone disease in the bony meatal wall; but with a probe he found the bone bare in the inferior petrous region. He did not think, therefore, the disease had reached the pterygoid region by implication of the bony wall of the meatus.

Epithelioma of the Left Auricle.—G. N. Biggs, M.B.—Specimen shown from a patient, female, aged sixty-two. The growth had been present for five months, commencing as a small nodule, which in about six weeks began to break down and ulcerate. Previous to appearance of the growth the auricle had been normal, and there was no history of injury. Slight shooting pain was present at first, but there had been none since, neither had there been any attacks of hæmorrhage. There was no involvement of the lymphatic glands.

Progressive Bilateral Deafness following Epidemic Cerebro-spinal Meningitis.—H. J. Davis, M.B.—The patient, a boy, aged six, was sent for an opinion as to whether anything could be done to improve the hearing or not. Three years ago the child had cerebro-spinal meningitis and nearly died; the hearing power has since become worse and worse, until, at the present time, he hears nothing with the left ear, and with the right ear appears just conscious of sound when a Bárány alarm apparatus is suddenly released in the meatus. He responds to this by closing the eyes, but as far as could be made out he hears nothing else. Neither labyrinth responds to the caloric tests, and the boy is impenetrably deaf. Hearing no conversation the child naturally speaks less and less, and if not suitably instructed he will become a deaf-mute.

Mr. CHEATLE asked why it was called progressive deafness; surely deafness occurred once and for all during the attack of cerebro-spinal meningitis. He did not think the hearing was improvable—he must learn lip-reading.

The PRESIDENT did not doubt that the boy could hear somewhat at present, though he was becoming worse. The tympanic membranes seemed to him to be in-drawn.

Dr. DAN MCKENZIE did not regard the child as impenetrably deaf, as his mother could make him hear, and had taught him to say some words, although the deafness had come on before the speech period.

Dr. URBAN PRITCHARD did not regard the child as so backward as the notes suggested.

Dr. H. J. DAVIS, in reply, said that by progressive deafness he meant that the hearing had slowly deteriorated. He believed the labyrinth was not destroyed at the time of illness, for the mother said he was now worse than before. When one was speaking the boy looked intently at the speaker's face.

Sudden Deafness following Scald to Membrana Tympani by Steam.—H. J. Davis, M.B.—The patient, a manageress in a laundry, aged twenty-nine, removed the lid off a cauldron. The steam escaped into her face, she turned her head sideways to avoid it, and at once felt acute pain in the ear and became "stone deaf" on that side. Locally there was nothing visible beyond blebs on the membrane and an exfoliating meatus, but the hearing on that side was lost to the whole range of forks. The membrane never perforated, and as the acute symptoms subsided hearing was restored and is now normal.

Mr. CHEATLE said he assumed that "stone deaf" was the patient's own expression. He had seen one case in a lady who was carrying a kettle full of boiling water upstairs, when she tripped, and some of the water entered her ear and burned a hole in her membrane. Her hearing subsequently became normal.

The PRESIDENT considered that there was a large psychological element in this case, as in cases of hysterical deafness following shocks.

Mr. WESTMACOTT said that he had recently seen a case of simulated deafness. It was that of a weaver who was working at a loom when she fell, and was said to have run a pointed instrument for picking up cotton into the ear and perforated the drum, causing her to be stone deaf. A fortnight after the accident, when he saw her, there was a small punctured wound in the posterior wall of the meatus only and not far from the orifice. Testing her with Bárány's noise apparatus, however, revealed that there was no deafness at all.

Deafness in Myxœdema.—H. J. Davis, M.B.—The case exhibited is one of three cases of myxœdema in women, presenting all the classical signs of the disease. In each instance they came to the Aural department first, as "they had come about their hearing." Their condition was obvious, and they were treated with thyroid extract, 5 gr., twice daily to commence with. In all there was marked improvement in hearing *pari passu* with improvement in general condition. The patient exhibited, a woman, aged forty-seven, I first saw in June, 1910, the tuning-fork tests pointing to affection of middle ear. A watch was inaudible on contact; membrane thin and transparent. After four months' thyroid treatment she heard a watch at 6 in., and to all intents and purposes was so well that she discontinued treatment; as she dropped back so did the hearing, and this happened twice. I saw her last, after twelve months' absence, on February 14. She is now in the same state as when I first saw her—watch inaudible, Rinne negative. Another point of interest in these cases is that audition is delayed—just as speech and movements are "deliberate" so is the hearing, *e. g.* when a vibrating fork is placed on the mastoid she may at first say she does not hear it, and a few seconds later she will say—"Oh yes, I do." I have no doubt she will improve, as she has done before, with thyroid treatment alone.

The PRESIDENT had had two similar cases, and in both improvement followed the administration of thyroid extract. He thought there were two elements in the deafness in those cases; one was a narrowing of the Eustachian tube, and the other the slowness of cerebral functions associated with myxœdema, which added some "nerve-deafness" to the case.

Epithelioma of Middle Ear invading the Middle and Posterior Fossæ of the Skull.—H. J. Davis, M.B.—Male, aged fifty-six. The

case was exhibited previously at the meeting on November 15, 1912,¹ when all that was visible was a malignant polypus protruding from the meatus. Three operations have been performed. The patient cannot be now shown as he is in intense pain—he is really dying of “earache”—and is kept under the influence of opium in the form of ex. colicæ, $\frac{1}{4}$ gr. *ter die*.

Photographs showing protrusion of auricle and the growth fungating through the meatus are exhibited.

[*Addendum*.—The patient died on February 20, and specimens of the temporal bone and the brain were exhibited, showing (1) the nodular growth implicating the dura mater in the middle and posterior fossæ; (2) the left half of the brain, showing a temporo-sphenoidal abscess lying above the growth. This had ruptured, and the patient died from suppurative meningitis. The under surface of the brain is invaded by cancerous growth. Specimens in formalin.

Pathological report of swab from cerebral abscess: *In films*, a long Gram-positive streptococcus and a Gram-negative short bacillus. *On agar and blood serum* a short Gram-negative, freely mobile bacillus was grown; this is probably *Bacillus coli*.]

Dr. DAVIS, in answer to the President, said that the patient was relieved of pain when the wound was left open.

Mr. MARK HOVELL mentioned a patient who was given doses of morphia, increasing as the disease progressed, until she was taking 30 to 40 gr. a day, and on her bad days, 40 to 50 gr. She used to awake free from pain, be quite cheerful, and take her food well, and to the end her suffering was but slight, in consequence of the treatment adopted.

Dr. H. J. DAVIS, in reply, said that he supposed the pain was that due to tension consequent on expansion of bone, and to nerve irritation consequent on their implication.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

January 10, 1913.

Mr. HERBERT TILLEY, *President of the Section, in the Chair*.

Obscure Case of Streptococcal Infection of the Throat.—

Herbert Tilley, F.R.C.S.—On November 18, 1912, I saw a boy, aged ten, who had been confined to bed for a fortnight because of an evening temperature which regularly reached about 100° F. Otherwise his general health was good. Tuberculous glands had been removed from his neck three years previously. At the commencement of his illness he had a slight sore throat, the small tonsils were a little red and swollen, especially on the right side, where the corresponding gland under the angle of the jaw was tender on pressure. These symptoms quickly disappeared, but the evening rise of temperature continued. Careful and repeated examination of the chest, etc., failed to give any clue as to the cause of pyrexia. The soft palate and fauces were a little congested, tonsils small, and no exudate in the mouths of the crypts.

November 20: I pressed out some foul-smelling exudation from each

¹ JOURN. OF LARYNGOL., RHINOL., AND OTOL., February, 1913, p. 99.

intra-tonsillar fossa, and next day small lenticular ulcers appeared where pressure had been applied; they healed very slowly.

November 24: Swabs taken from the region of the right tonsil revealed streptococci in almost pure culture. November 25: Dr. Eyre ascertained the presence of a few streptococci in urine removed by catheter from the bladder. November 27: Evening temperature, 101.6° F.; shivering fit. November 28: Opsonic index to *Streptococcus longus*, 0.72; 2.5 millions of autogenous vaccine of mixed streptococci and staphylococci injected. November 29: Temperature, 102.4° F.; shivering fit. November 30: Ten cubic centimetres polyvalent antistreptococcus serum injected. December 1: Temperature 103° F.; 1.25 millions of autogenous streptococcus vaccine. December 2: Opsonic index 1.5-2. December 4: 1.25 millions of vaccine. December 5: Temperature falling. December 7: Temperature 99.6° F.; 1.25 millions of vaccine injected. From this point onward the patient made an uninterrupted recovery.

The interesting features in the case were: (a) The very slight throat symptoms and pathological appearances, combined with a definite and otherwise obscure pyrexia. (b) The excellent general condition of the patient during the greater part of his illness. (c) The appearance and slow healing of the small ulcers caused by the pressure of a wool-covered strabismus hook on the outer surface of the tonsils. The interesting points from the bacteriological point of view were: (a) The isolation of a streptococcus apparently identical with that causing the throat lesion from the otherwise normal urine—from 10 c.c. of a catheter specimen two colonies being obtained. (b) The lack of response on the part of the patient to a vaccine prepared from the throat exudate, in which approximately equal numbers of streptococci and staphylococci were present, and the immediate response to an autogenous vaccine prepared from the streptococcus derived from the urine, unmixed with other organisms. Mr. Herbert Tilley added that there was little to be seen in the throat beyond a redness similar to that observable in the throat of a cigarette-smoker. The tonsils were not enlarged, and it was difficult to make up one's mind from mere appearances that the throat could be the source of the general infection.

Mr. DE SANTI asked whether the President considered it an acute infection. He had recently seen a streptococcal case. A bad odour emanated from the mouth, and the man himself felt sure his throat was affected. Two years before he had a retropharyngeal abscess, and had nearly died. He was injected with an autogenous vaccine, but without benefit.

Mr. STEWART mentioned a boy, aged nine and a half, who had had four similar attacks in twelve months. He did not examine the throat in the first three. The attacks consisted of general malaise with pyrexia, the temperature running up to 104° F. No other symptoms were present and no other cause could be discovered, but he was always supposed to be going to have an exanthem. When examined in the fourth attack, a little spot was found on one tonsil. Dr. Eyre took a culture, found the *Streptococcus longus*, and proceeded to prepare a vaccine; but during the next twenty-four hours the temperature subsided, and the boy got well.

Dr. DAN MCKENZIE, in view of the lack of response to a vaccine prepared from the patient's throat, asked if the streptococcus recovered from the throat had anything to do with the streptococcus recovered from the urine. He understood that various strains of streptococci might have no relationship with each other

Mr. E. D. DAVIS asked if there was any possibility of it being a pneumococcal throat. There was great variability if the pneumococcus was not encapsuled.

The PRESIDENT replied that he scarcely knew how to answer the question whether it was an acute infection. The illness could scarcely be termed an acute infection. With regard to enucleation, he wished to exhaust every means of getting the boy well without operation. It was difficult to be certain whether the case got well because of the inoculations of vaccine, or whether convalescence would have been established without that form of treatment.

Tuberculous Ulcer of the Right Vocal Cord cured by the Application of the Galvano-Cautery.—Herbert Tilley, F.R.C.S.—The patient, an elderly man, suffering from hoarseness, was being treated for pulmonary tuberculosis. The posterior three-quarters of the right vocal cord was occupied by a shallow ulcer surrounded by pale granulations. By the direct method, three deep punctures were made through the floor of the ulcer with the galvano-cautery and at the one sitting. The ulcer had quite healed and only a slight congestion of the cord could now be seen. At present the patient had well-marked physical signs at the back of the right apex and tubercle bacilli in his sputum. He was going to a sanatorium. It was easy to use the direct tube with cocaine, and galvano-puncture could be carried out with great accuracy. Of course the indirect method could probably have been used, but he did not think he could have applied the cautery as accurately with it as with the direct method.

Granular Congestion of Left Vocal Cord, probably Specific in Origin.—Herbert Tilley, F.R.C.S.—A male, aged fifty-four, had suffered from hoarseness since childhood, worse in spring and autumn. The last attack was present for three weeks. He had lost 10 lb. during the three months previous to my seeing him. There was a history of syphilis. The left vocal cord was granular and congested, and a small superficial ulcer occupied its posterior third. The history and appearances suggested tuberculosis, but pulmonary signs were entirely absent, and the ulcer disappeared under potassium iodide.

Laryngeal Palsy due to Nuclear Lesions of the Vagus.—L. Colledge, F.R.C.S.—CASE 1.—Patient is a girl, aged twenty, who came to the out-patient department complaining of nasal obstruction. She complained that in addition she had recently had difficulty in swallowing, and her food and drink had been coming back through the nose. Four days before admission she suddenly noticed loss of vision in the left eye. Condition is as follows: Central scotoma of left eye, vision $\frac{6}{60}$; paresis of left external rectus muscle; paresis of left half of soft palate; paresis of left sterno-mastoid muscle; abductor paralysis of left vocal cord. Wassermann's reaction is negative.

CASE 2.—Patient is a girl, aged seven. She was admitted for acute mastoiditis, and Schwartz's operation was performed. Radical operation on November 30. No evidence of tuberculosis in the aural discharge. Condition otherwise is as follows: Complete paralysis of left vocal cord: the cord is in the cadaveric position, it is relaxed and sickle-shaped, and the arytaenoid is prolapsed forwards; paralysis of the left trapezius and sterno-mastoid; atrophy and paralysis of the left half of the tongue. In addition the pulse has varied between 120 and 146 ever since admission, which may be due to interference with the functions of the vagus. The

diagnosis in both cases is a lesion in the left half of the medulla, probably tuberculous in nature.

Mr. ROSE said he had seen a girl, aged seventeen, who had similar symptoms, but on the right side: a very careful examination was made to find the cause, but with no result. She was kept under observation for two or three months, and during that time she completely recovered. She was taking iodide of potassium, but there was no other reason for supposing she had syphilis.

The PRESIDENT said that of the cases with somewhat similar lesions that he had shown, one was syringomyelia, and the other in an adult who had paralysis of the trapezius, sterno-mastoid, left vocal cord, and left side of the palate. This case belonged to the same category as the cases described by Hughlings Jackson and Morell Mackenzie years ago. Some of these were probably due to pachymeningitis involving the membranes at the base of the skull and the foramina where the cranial nerves made their exit.

Congenital Membrane of the Larynx.—George W. Badgerow, F.R.C.S.Ed.—A boy, aged six, was sent complaining of weakness of voice. On examination of the larynx a membrane is seen situated at the anterior commissure stretching between the cords, an opening only left in the posterior part of the glottis. There does not seem to be any interference with respiration. Should treatment be undertaken?

The PRESIDENT said that years ago Sir Felix Semon wrote of one or two cases in which the congenital laryngeal web was associated with coloboma iris. The latter condition was not present in this boy.

Mr. A. J. HUTCHISON said that many years ago he saw a child who had a congenital web. It was operated upon by the late Sir H. T. Butlin, and the result was unsatisfactory, as though breathing was somewhat better and the child took more exercise, there was no improvement in the voice and she could not yet speak above a whisper. She could not take more active exercise than golf.

Dr. DONELAN said that the important factor in the case was that there was no interference with respiration. While that was so he thought that it would be better to avoid any treatment. The treatment of these webs was always difficult and unsatisfactory. The only reliable way of effecting a speedy cure was that followed in Dr. Hill's case, in which the result had been satisfactory.

Dr. FITZGERALD POWELL said the consensus of opinion seemed to be that the case should be left alone. If operation were found necessary for the safety of the boy, he thought the method he had used for stenosis of the larynx would be the best. A high tracheotomy was performed, and through this opening it would be possible to incise the web: having done this, suitable silver plugs were inserted upwards into the larynx above the tracheotomy tube and lying on it. These plugs were used continuously for a period of six to twelve months, and the result in the cases of stenosis in which they were used was excellent. The tracheotomy wound was allowed to heal, the larynx remaining patent.

The PRESIDENT said it would be interesting if, in the light of this discussion, Dr. Hill could arrange to show his case again. If in removing the web two raw surfaces were made, unless means were taken to prevent the opposing granulations from uniting, the original evil would be reproduced. He had had considerable experience of these cases of recurrent papillomata of the larynx, and in the inveterate cases it might be advisable to consider splitting of the larynx and inserting the "wing"

obturators, so that one could deal directly and very frequently with the first signs of recurrence and without the necessity of general anæsthesia.

Dr. DUNDAS GRANT, while agreeing that the case was best left alone for the present, said the chief anxiety would be lest the child had one of the exanthemata, in which case the laryngitis would be apt to be suffocative. If tracheotomy should have to be done, then plugs could be used, as mentioned by Dr. FitzGerald Powell, or those devised by Dr. Thost, of Hamburg.

Case exhibiting Lingual Gymnastics.—E. A. Peters, M.D.—

Female, aged thirty-five, is able to pass her tongue behind the soft palate, where the Eustachian tubes and inferior turbinates are recognised thereby. It has been said that certain cases of suicide have been effected in this way.

Dr. SYME said he had seen one such case in a girl, the subject of atrophic rhinitis. It might be that she had gradually brought on her condition by working her tongue back into the naso-pharynx to allay the irritation. He thought the hard palate here was shorter than usual, and the soft palate seemed to have developed excessively.

Dr. DAN MCKENZIE did not agree that there was any deficiency in the hard palate; there was no nasal intonation. He believed the condition was due to the mobility of the tongue. He had seen cases of atrophic rhinitis in which the patient had learned to get rid of the crusts by means of the tongue.

The PRESIDENT said he had been told that this condition was not very uncommon, and that people had been known to commit suicide by pushing the tongue upwards and backwards into the post-nasal space. [Dr. DONELAN: It was a common method of suicide in the slave-ships.]

Multiple Papillomata of the Larynx.—E. A. Peters, M.D.—

Female, aged nine, has suffered with dysphonia for three years. Two years ago her tonsils were removed to relieve croup. There are several elongated papillomata of a pinkish-grey colour growing in the region of the false cords. Is this case suitable for the direct or alternatively the laryngotomy method?

Mr. STEWARD believed in the advantage of operating by the direct method, and persevering until the papillomata were got rid of. In this child, aged nine, they probably would not recur very quickly. He still had cases under supervision on whom he had been operating for six to eight years, and one of them had passed the last year without need of operation. He would not advise Dr. Peters to do thyrotomy in this case, as he would find it practically impossible to keep the larynx open sufficiently long, and there was great danger of subsequent stenosis of the larynx. He had seen extreme stenosis of the larynx follow thyrotomy.

Mr. HOPE said that he had operated on a case by the direct method. The child wore an intubation tube during four days, and then went home. This was done four times during the year, and was very little trouble. The intervals seemed to be getting longer.

Dr. FITZGERALD POWELL thought it necessary that a tracheotomy should be performed in children with these multiple papilloma before proceeding to their removal, either by the direct or indirect methods. It protected the child from dangers that might arise, such as spasm or œdema, and the opinion has been held that it had a curative effect in resting the larynx.

Dr. DAN MCKENZIE said he had had a case where tracheotomy had

been performed, as she had cyanosis; and that wound was very useful in subsequent treatment. Papillomata were taken away regularly by the direct method with a confidence that could not have been felt in the older days. There was no recurrence of the growths two years afterwards. He asked if members had tried carbonate of magnesium internally for the condition, as dermatologists were using it for papillomata of the skin.

Mr. ROSE said he attempted to cure two patients by calcined magnesia administered internally. One of the patients declared she was better, but he was certain that was not so. In the other case, neither the patient nor he thought there had been any result. The age of one of the patients was forty. No attempt had been made to remove the papillomata before, though her symptoms lasted from her sixth year. Therefore, those who hoped a child would grow out of the condition had an uncertain foundation for their belief.

Dr. DUNDAS GRANT considered that repeated operation was the best method, and after removal of the bulk of the growths, cauterisation. He had used an alcoholic solution of salicylic acid, as he was convinced it tended to prevent re-growth. Tracheotomy was often necessary, but that was not a "specific" for papillomata of the larynx. He had seen a case which was tracheotomised in early childhood for papillomata of the larynx, in which the patient came under his care at her twenty-first year. He cleared out the papillomata and removed the tracheotomy tube.

The PRESIDENT spoke of a boy who attended his hospital every two or three months, and who was said to have been operated upon forty-three times. Certainly he had removed hundreds of papillomata from this boy on different occasions. They had recently crept up the side of the pharynx on to the soft palate, and below had come out through the old tracheotomy opening, and formed not only a mass of granulations around the tracheal opening, but there was a smaller mass growing on the larger mass. The local infectiveness of these warts in some subjects made them seem almost intractable to treatment. In the patients referred to he had operated several times by the direct method, and was satisfied that every visible papilloma had been removed, then a 20 per cent. solution of salicylic acid in collodion had been applied, but the growth rapidly recurred, and had not been checked by the internal administration of arsenic.

Tumour of the Left Antrum.—E. A. Peters, M.D.—The patient was shown on March 29, 1912.¹ On that occasion various opinions as to its nature were expressed. Before the operation a trocar inserted through the inferior meatus became impacted in a solid growth. The upper lip was dissected from the canine fossa, which was incised, and revealed a solid mass of soft, cancellous, bone-like tissue. By means of a gouge an attempt was made to reproduce an antrum, which was then opened in the usual way into the inferior meatus. Unluckily the piece of growth received for microscopical examination was thrown away, so that it is impossible to exclude the diagnosis of a slow-growing carcinoma. The tumour was noticed three years ago and expanded the antrum in all directions, except the palate. The outer wall was very hard.

Dr. KELSON said he was interested in this case, as, from time to time, cases had been shown before the Section resembling leontiasis ossium and those bony growths of the maxilla common on the West Coast of Africa,

¹ See JOURN. OF LARYNGOL., RHINOL., AND OTOL., vol. xxvii, p. 377.

yet differing somewhat from both of these. These cases, when brought up, had been thought by some to be due to syphilis, and by others as due to some other micro-organism. They had all been bilateral, but not symmetrical. Dr. Peters's case seemed like that condition limited to one side, and on looking into the nose of this patient he saw that the inferior turbinate on that side was much enlarged, as in his own case. The bone, he believed, would be found to be very brittle. The condition was not malignant, and he believed good results would follow operation.

Mr. HOWARTH said that the case did not at present appear to be malignant. He asked whether it was translucent, and what the X-ray picture revealed? He had seen a similar case, which was quite translucent, and which was thought to be a cyst in connection with one of the teeth. It was outside the antrum, and at the operation it proved to be what was thought. In operating through the labio-gingival fold, the cyst, which was the size of a pigeon's egg, was shelled out without opening the antrum at all. The anterior wall of the antrum had been pushed back so far by the cyst that there was practically no antrum on that side. This present case might be similar, and it also might be pushing the naso-antral wall in. He did not think the turbinate was large, but had the appearance of being pushed into the nasal cavity.

Dr. SYME said the case reminded him of one shown before the Scottish Otological and Laryngological Society, which was thought by some to be leontiasis ossium, while others regarded it as a cyst. When Dr. Adam, who showed the patient, operated, there was found to be, on both sides, a firm fibrous growth which had undergone osseous changes. Both antral cavities were involved.

Dr. PETERS, in reply, said on trans-illumination the antrum was dark, and there was slight enlargement of bone. An incision was made into the canine fossa last April, and an attempt made to fashion a new antrum out of the solid mass of soft bony material. There was no trace of a dental cyst. On talking over the matter with Dr. Westmacott, he thought it might be a case of hyperplasia of the antrum in which vacuolation had not occurred in the maxilla, and that there had been retrogression of the bone and the formation of solid material. In one case Dr. Westmacott scooped out the central mass of the bone to the zygomatic arch. One of that gentleman's cases dated back twenty years, and recovered absolutely.

Unusual Form of Syphilitic Laryngitis.—C. W. M. Hope, F.R.C.S. Female, aged thirty-nine, was shown at the November meeting,¹ suffering from hoarseness of twelve months' duration. Having been resident in Norway seven years, she was shown for diagnosis. ? Leprosy. The uvula, both arytenoids (especially the left), epiglottis, and both ventricular bands showed white, solid swellings; palate was not anæsthetic, and healed scars were seen on the posterior pillars of the fauces and on the post-pharyngeal wall. Cords were normal. No ulceration present. Patient felt very lethargic and disinclined to do anything entailing the least exertion. The Wassermann reaction proving positive, I gave her, on November 14, 1912, 0.6 grm. of salvarsan intravenously. There was a marked reaction, lasting ten hours. Temperature up to 102 F., vomiting once. On December 11, 1912, patient reported herself as feeling much better generally; hoarseness had all gone. On examination the only swelling in the larynx was a slight reddish enlarge-

¹ JOURN. OF LARYNCOL., RHINOL., AND OTOL., April, 1913, p. 210.

ment of the left arytaenoid. The uvula was still swollen, though much less. A second dose of 0.6 grm. of salvarsan was given, and a reaction as at the first injection occurred.

Dr. LIEVEN (Aix-la-Chapelle) said he noticed that reaction was said to have occurred each time after giving the salvarsan. He did not consider it at all necessary for such reaction to occur, especially in tertiary syphilis. Reaction occurred for two reasons: (1) from the spirochaetæ and their toxins, and (2) from the toxic reaction of the arsenical preparation. Every individual had his own limit of tolerance, and by proceeding cautiously that limit need not be exceeded. In Germany, 0.5 grm. for an initial dose was the rule, and his own practice was to give not more than 0.35 grm. in the first injection. No reaction should, as a rule, be produced in tertiary syphilis, because there were not enough spirochaetæ present. For secondary syphilis it was advisable to eradicate most of the organisms by means of mercury and finish the case off by salvarsan. A dosage which was toxic for a patient once would assuredly be so again; therefore if a marked reaction occurred a smaller dose should be given on the second occasion. Dr. Levy-Bing, at the Hôpital St. Lazare in Paris, having excluded syphilis of the nervous system by a cytological examination of the cerebro-spinal fluid in a series of prostitutes with primary and secondary syphilis, gave them injections of salvarsan. About a month afterwards, on re-examination of spinal fluid lymphocytosis was present in every case, so that there had certainly been a neurotropic effect produced by salvarsan. It was vital to avoid the accidents which lead to encephalitis hæmorrhagica, and that could be done by limiting the doses which produced no reaction. The dose of 0.6 grm. given in the present case he regarded as rather large. Even experienced syphilologists had their bad cases with even moderate doses, because one can never foretell the individual tolerance. At Liège, Professor Troisfontaines reports the death of an otherwise healthy girl, aged, he believed, twenty-three, after a dose of 0.5 grm. She died on the second or third day from hæmorrhagic oedema of the brain. He had seen several cases rendered drowsy or even unconscious from the drug on the second or third day. In his opinion, such cases were due to a temporary oedema of the brain. A lady patient, aged thirty-five, suffering from secondary syphilis, had twenty mercurial inunctions, and subsequently he gave her an injection of 0.5 grm. It was, however, too much for her, for on the second day he was urgently called to her, and she was found to have bilateral paralysis of the abductors, with hallucinations, of which the former cleared up in four days whilst the latter lasted a week. He was always glad when the third day from the injection had passed. With regard to the permanency of the effect of salvarsan, that had been largely solved by Professor Bayet, of Brussels, who treated several large series of syphilitics in the "Hôpital St. Pierre." They were treated without mercury, and got up to five intravenous injections for a period extending in general over five to six weeks, and the clinical result had been very good, whilst the effect on the Wassermann reaction proved to be largely negative. His impression was that by the combined treatment of mercury and salvarsan relapses during the secondary period, particularly relapses on the mucous membrane of the tongue and pharynx, had become very rare. That was very important, because such treatment must lessen the amount of domestic infection. He knew altogether of five cases of death reported after giving salvarsan, but he was of opinion that a number had occurred in private practice which were not recorded. It was the duty of medical men to perfect their knowledge of effective

and safe treatment of the disease. One should not go on introducing arsenic into the system just because the Wassermann reaction did not become negative, because it must be left to the future to decide the final effects, if any, of salvarsan on the body, especially as we know comparatively little as yet of the rate of excretion of the arsenic from the body.

Mr. HOPE replied that when he showed the case in November, one diagnosis was atypical myxœdema and another was laryngeal hyperplasia, the Wassermann reaction not then being known. He showed the patient again because her general condition had so markedly improved. He agreed that her palate was still much the same as before. He had treated sixty to sixty cases of laryngeal and nasal syphilis with salvarsan, and this was the only one in which there had been a reaction, with temperature or vomiting. But all the other cases, except this woman, had been treated with mercury first. In all the other cases he had given the same dose, except for children, for whom it was 0.2 or 0.3 gm.

Dysphagia from ? Gumma of the Tongue.—**W. Jobson Horne, M.D.**—A man, aged forty-nine, came to hospital last December with pain on the right side of the throat of one month's duration. The pain had extended to the right ear. He thought that he had been losing flesh during that time, which could be accounted for by the fact that he had not been able to take solid or even liquid food. Some twenty years ago he had lues venerea—he was at sea, and the treatment was rough, but not thorough. Wassermann test had not been done. When first seen the only noticeable feature was a marked deviation of the tongue upon protrusion to the right side. No glands were palpable in the neck. Possibly the right vocal cord did not move as freely as the left. The right side of the base of the tongue was greater than the left side. But apart from these, there was no gross lesion to account for the gross symptoms. Iodide of potassium and perchloride of mercury were prescribed, and the patient was rapidly enabled to swallow. The case is shown with a view of clearing up any doubts about the cause of the dysphagia. The dysphagia appeared to be entirely pharyngeal and due to the swelling at the base of the tongue, which he regarded as a gumma. The rapid diminution of the swelling and the accompanying rapid relief of the dysphagia under antiluetic treatment tended to conform those views of the case.

PROCEEDINGS OF THE FRENCH SOCIETY OF LARYNGOLOGY, OTOTOLOGY AND RHINOLOGY.

Meeting May 13, 1912.

President : G. GELLÉ (Paris).

(Translated by H. CLAYTON FOX, F.R.C.S.I.)

Malignant Growths of the Ear Simulating Chronic Otorrhœa.
—**Brindel (Bordeaux).**—A woman, aged seventy-five, had suffered severe pains in the ear for three days. There was a history of painless otorrhœa for the past thirty years. The mastoid process seemed slightly

painful over the antrum and at the apex. The radical operation was performed, but pain persisted and even became more acute, radiating towards the temporal fossa. M. Moure, in consultation, suspected meningeal involvement. A fresh intervention revealed nothing abnormal about the meninges, but the author found a mass of granulations in the anterior inferior part of the tympanum. These were removed, and on microscopic examination proved to be glandular carcinoma. Some days subsequently the patient developed facial paralysis, and death ensued five months later. The author has, up to the present, met with three epitheliomata, seven carcinomata and ten sarcomata originating in the ear. He insisted on the frequency of sarcomata in children, a previous history of chronic otorrhœa, and on facial paralysis met with sixteen times; definite lesions of the internal table were present in eight cases. Malignant growths, at their onset, frequently simulate chronic otorrhœa.

MOURET (Montpellier) reported an unusual case of growth, which might have been considered malignant and treated as such. In December last he saw a patient suffering from chronic otorrhœa with numerous fistulæ; there was a fleshy mass in the fundus of the external meatus, which was found to be a carotid aneurysm. It gave rise to swelling around the pinna, and considerable bulging in the mouth. Ligature of the external carotid was performed, and a few days afterwards the auricle was reflected and the aneurysm dealt with. When a patient presents a fungous swelling of the auditory meatus, the possibility of an aneurysm should be considered.

Rhinorrhœa and High-Frequency Currents.—**Castex** (Paris).—Man, aged twenty-four, suffering from intermittent attacks of a copious discharge of clear fluid, associated with pains in the frontal sinuses and dimness of vision. The crisis lasted about forty-eight hours. This patient had been greatly relieved by high-frequency currents. In several other cases of a similar nature the treatment has yielded equally good results. The author considers that the currents act by inducing vaso-constriction, and that their efficacy is certain in all cases of rhinal hydroorrhœa.

Treatment of Nasal Fractures.—**Garel** (Lyons).—The author thinks that the various methods adopted for these fractures is incomplete. He exhibited an apparatus (made by Martin and Sons, Lyons), which had always given him good results. In nasal fractures it is necessary, after reduction of the nasal bones, to bring the septum into the middle line and to maintain all in good position. The apparatus consists of a forceps for reducing the depressed parts, and a little prosthetic mechanism composed of two movable wings parallel and adjustable. After the reduction with forceps, this apparatus is introduced into the nasal fossa, and keeps the septum in a vertical position. The only inconvenience is, that it is not applicable to all cases, but it can be modified according to requirements. In a case of urgency, Martin's apparatus not being to hand, the author has reduced the fracture with forceps and inserted Moure's metallic tubes into the nasal fossæ; but to ensure correct position of the septum, he has devised an external splint of red vulcanite, moulded whilst warm to the outer surface of the nose; red vulcanite is preferable to yellow, for the latter very quickly softens.

Artificial Ear-Drum.—**Jacques** (Nancy).—For this purpose the author utilises a little disc of sterilised rubber, which he applies to the

postero-superior part of the meatal fundus. Adjusted by the surgeon, this drum remains in position and can be worn for weeks or months. During the first few days after insertion one must be on the look-out for inflammatory reaction, which is, however, rare. Should tympanic supuration occur the pus displaces the drum, and there would be no danger of retention. The author considers that the disfavour shown towards the artificial membrane is by no means justified. Properly adjusted and kept under observation it is satisfactory; moreover, the aids which we possess for combatting deafness being neither numerous nor perfect, there is no reason for rejecting it.

MOURE (Bordeaux) said that suppuration sometimes follows the application of the artificial drum, but this form does not obstruct sufficiently to allow of pus retention in the tympanum. In many cases there is no suppuration; he, however, thinks that there is an advantage in keeping the artificial drum moist. He has very frequently noticed that the patient can after a while apply the drum to greater advantage than the surgeon himself.

BOZAIN (Brest) shared Moure's opinion as to the utility of moisture of the tympanic wall. He employs little balls of cotton-wool moistened with liquid paraffin.

GELLÉ (Paris) also used cotton balls moistened. He has also noticed that the patient can apply the drum better than anyone else.

Treatment of Nasal Synechiæ, Congenital and Post-operative.

—MOURE (Bordeaux).—For maintaining raw surfaces apart, the celluloid plate is irritating, occupies considerable space, and is altogether intolerable for the patient. Moreover, as soon as it is removed, the synechiæ immediately recur. The author has substituted a plate of mica, which can be thinned at pleasure, and possesses the advantage of great malleability and suppleness. The plate should completely separate the raw areas, and can remain in position ten to fifteen days. This method has yielded the author splendid results, even in cases of intractable adhesions.

“Bleeding Tumour” of the Septum.—BAR (Nice).—These tumours are due to dilatation of capillaries situated at the junction of the septal cartilage with the vomer. They may give rise to very severe hæmorrhage, may recur, and have been supposed to undergo sarcomatous degeneration (Lermoyez). They are made up of a connective-tissue stroma, enclosing numerous blood-vessels in its meshes. Some writers consider them fibromata, with proliferation of blood-vessels. This proliferation is explained by the structure of the nasal septum.

Reflections on the Subject of the Removal of Malignant Tumours of the Ethmoid.—BOURQUET (Toulouse).—There are several weak points on the outer wall of the nasal fossæ, called fontanelles, formed by apposition of the nasal mucosa with that of the maxillary sinus, no bone intervening. These fontanelles are easily infiltrated, and the author considers that up to the present operations have not been sufficiently extensive. When one practises Moure's operation these fontanelles are neglected and the growth frequently recurs. He has treated a patient previously operated on by Luc, who showed a fresh infiltration. With the aid of diagrams the author described his method: he makes two incisions, one latero-nasal as in Moure's procedure, and another parallel to the orbital margin; he strips the orbital wall, detaches the pulley of the superior oblique and removes the lachrymal sac, and

the orbital contents are held aside by an assistant, he then successively removes with forceps all the anterior wall of the maxillary sinus, and working upwards towards the orbit, divides its floor and the nasal process of the maxilla. By a horizontal section he detaches the floor of the maxillary sinus and breaks down its posterior wall. The ascending process of the maxilla, the ethmoid, and the whole of the internal wall of the antrum can then be removed *en bloc*, without force and without curettage. The results have always been excellent, and recurrence has never been experienced.

MOURET (Montpellier) said that in performing such an operation one never knows precisely beforehand what one has to remove, because it is difficult to recognise the lesions with which one may be confronted as well as their extent. In these interventions one proceeds as the lesions are unveiled. The lesions are atypical, and they alone can, and must, guide the operator.

BRINDEL (Bordeaux): These growths, in common with others of the nasal fossæ, are not very malignant.

BROECKHAERT (Ghent) insisted on the necessity for removing the inferior turbinated body.

Pedunculated Epithelioma of the Right Vocal Cord; Removal by the Internal Route; Non-recurrence after Four Years.—**Cabouche** (Paris).—A man, aged fifty-four, suffered from a pedunculated epithelioma of the right vocal cord. The patient only consented to be operated on with the proviso that the intervention should be carried out by the internal route. Cabouche acceded to the request, and removed the cord. The patient has made a perfect recovery, and a cord has been reproduced.

CASTEX (Paris) said that cancers of the larynx are very variable from an evolutionary point of view; some are benign, others malignant. He operated on two patients at some months' interval; there were small, sessile, epitheliomatous, non-pedunculated vegetations on the vocal cords. He performed laryngo-fissure, and simultaneously removed the vocal cord and corresponding soft parts. Recovery has been definite and lasting in both cases. He considers the endo-laryngeal route not to be preferred, and should only be adopted in certain special circumstances such as attended Cabouche's case.

Secondary Laryngeal Cancer.—**Lannois and Mont-Charmont** (Lyons).—The author reported the case of a man who consulted him for extreme dyspnoea and dysphagia. Laryngoscopy revealed an aryteno-epiglottic tumour situated in the pyriform fossa. The patient, who was very cachectic, died the next day. The autopsy showed the presence of an ary-epiglottic neoplasm, but another growth was found some distance away on the œsophagus clearly distinct from the other.

Slight Modification in Laryngostomy Dressings.—**Molinié** (Marseilles).—Sargnon's method of obtaining patency of the operation opening by gauze tampons smeared with vaseline is not very satisfactory: the tampon is very difficult to retain in good position, rapidly becomes fetid, and requires frequent changing. The author has devised a substitute which has always given good results. The tube used for dilatation is completely surrounded by a band of rubber after introduction into the wound, the free extremities of the band are carried backwards, one on either side of the neck, and tied behind by means of two threads. In

this way the rubber exercises a certain amount of tension on the soft parts. Patency of the wound is always assured, and the dressings become easy. With this method the cannula can very soon be removed. As soon as the larynx is large enough to admit a tube, one of appropriate calibre is inserted and kept in place by rubber bands.

Pharyngo-laryngeal Glanders.—**Mahu** (Paris).—In August last a veterinary surgeon, aged thirty, became infected. Pleuro-pneumonia and abscesses of the legs and thighs followed; these were opened, and pus therefrom yielded *Bacillus Mallei*. After three weeks the general condition improved, but bronchial catarrh persisted. Early in March he became aphonic. Laryngoscopic examination revealed an extensive subglottic ulceration. The vocal cords were destroyed and the left ventricular band was red. Lesions were present in the cavum pharyngeum which passed through three successive stages: (1) A carmine red, nodular appearance of the mucosa. (2) Small ulcerations with yellowish borders, gradually becoming confluent. (3) Extension in depth.

Inoculation of guinea-pigs with the pus gave negative results, which is explained by the depth to which the bacilli had penetrated. The epiglottis was not involved. Discharge from the nose had been slight; the nasal mucosa was swollen but not ulcerated. Topical agents—iodine, nitrate of silver, etc.—gave no result. The patient's health is not very bad. The author proposed to send him for an altitude cure.

Communication on the Application of Local Anæsthesia in Oto-Rhino-Laryngology.—**Luc** (Paris).—The author recalled the methods adopted by Türk and Schrötter in the pre-cocaine period of laryngology. Türk repeatedly swabbed the larynx with a mixture of acetate of morphia, alcohol and chloroform, which only effected a relative anæsthesia after several hours. This form of anæsthesia often resulted in several hours, or even days, of severe toxic symptoms. Schrötter swabbed the mucosa with a 10 per cent. solution of hydrochlorate of morphia, having previously applied chloroform, which, by the hyperæmia induced, facilitated absorption of the narcotic. The patient, watched with care, was ready for operation on the next day morning. Gradually cocaine, adrenalin with cocaine and Bonain's mixture enabled local anæsthesia to make a great stride, and soon the same agents were injected into the tissues covering cavities involved in the operative domain of oto-rhino-laryngology.

A. General Technique.—For infiltration the armamentarium consists of an anæsthetic solution and a suitable syringe of 1 to 2 c.c. capacity, such as that of Reclus. Cocaine is still the agent of choice for surface application, but its toxic effects constitute a serious drawback when injected into the tissues. Fortunately we now possess in novocaine an analgesic which, in conjunction with adrenalin, is as valuable as cocaine without the toxicity of the latter. Reclus employs it dissolved in physiological serum, which neutralises its slightly irritant properties. The author's formula is:

Serum 100 grm.

Novocaine 1 „

To which at the last moment he adds a few drops of adrenalin solution, 1-1000.

To ensure a certain result, the regional method of infiltration (one is never certain of having reached the nerve aimed at) must be completed by infiltration of the operative field. In addition, when possible, the

author applies gauze ribbon impregnated with cocaine and adrenalin to the mucosa of cavities concerned in the operation.

An hour previous to the operation the author's patients are injected with hydrochlorate of morphia, at least 1 cgrm. in the case of adults, and the dose is doubled should the patient be neurotic or exceptionally anxious and excitable.

B. *Special Technique for Various Regions.*—I. *Nasal Fosse and Accessory Cavities: (a) Resection of Septum.*—Both sides of the entire septum are carpetted with large flat tampons moistened with the following solution :

Hydrochlorate of cocaine	2 grm.
Solution of adrenalin, 1-1000	5 „
Water	5 „

Five minutes afterwards the tampons are removed and injections of novocaine and adrenalin introduced. Apart from the analgesic and ischæmic effects induced, the injections elevate the mucosa and facilitate its detachment. Ten minutes after the last injection the operation may be commenced.

(b) *Moriform Hypertrophy of the Posterior Ends of the Inferior Turbinate Body.*—Embarrassment is often experienced in operating on these lesions, for the anxiety experienced by the patient exercises a depletive effect on the cavernous tissue, and the hypertrophies almost disappear. This difficulty is overcome by infiltration of the parts with a needle curved at an obtuse angle. Blanching and augmentation in volume follows, and removal is easy.

(c) *Radical Cure of Nasal Polypi: Resection of the Middle Turbinate Body: Opening of the Ethmoidal Cells.*—For these procedures the author combines the contact and regional methods of anæsthesia. In practising the former, a tampon of cotton-wool soaked in a strong solution of cocaine and adrenalin is introduced between the polypi which hide the middle turbinate; as soon as the latter becomes visible it is enveloped with ribbon gauze moistened with the same solution, and fifteen minutes afterwards resected. To obtain more perfect anæsthesia in troublesome subjects the author adopts the regional method. Injections made on to the nasal nerve at its entrance to the anterior internal ethmoidal canal and to the superior maxillary nerve in the neighbourhood of the sphenopalatine ganglion will induce effective anæsthesia of the nasal fossa of the corresponding side. The nasal nerve is hit off by introducing the needle of the syringe along the superior internal angle of the orbit for a distance of about 2 cm. from the orbital margin. The superior maxillary nerve is accessible by three routes: (1) Anterior or orbital (Chevrier): the needle is thrust along the external portion of the floor of the orbit as far as its apex. (2) The inferior or buccal, proposed by Jeay, and derived from Schlosser's method for alcoholisation of the fifth nerve in neuralgia. (3) The external or sub-zygomatic, suggested by Munch, and inspired by the methods of Baudion and Levy.

(d) *Removal of Malignant Growths through Moure's Naso-maxillary Route (Lateral Rhinotomy).*—The author related a case of neoplasm of the superior maxilla operated on by Moure under simple local anæsthesia, without difficulty or pain.

(e) *Radical Cure of Chronic Maxillary Antritis by Caldwell Luc's Method.*—Anæsthesia is, in this case, induced by infiltration in front of the anterior antral wall, surface application in the cavity of the sinus (in view of curettage), and in the inferior meatus (for making the naso-antral opening).

(f) *Radical Operation for Chronic Frontal Sinusitis by the External Route.*—Local anæsthesia has always given the author very satisfactory results. His procedure is as follows: (1) A long strip of gauze soaked in cocaine adrenalin solution is inserted in the upper anterior part of the nasal fossa towards the infundibulum. (2) Infiltration of the skin at the site of Killian's curved incision with a weak solution of adrenalin and novocaine. (3) Subcutaneous infiltration of that portion of the periosteum elected to be resected, and massage. The nerves to be infiltrated are the fronto-ethmoidal branch of the nasal nerve and the frontal. The technique of the former has already been described. For infiltration of the latter, the needle is introduced along the superior wall of the orbit, a little internal to the median line for a depth of 2 cm.; here one is certain of reaching the nerve behind its bifurcation. During penetration the anæsthetic is injected slowly to ensure its coming into contact with several of the terminal branches of the nerve.

(g) *Opening the Sphenoidal Sinus Intranasally; Hypophysectomy by the Trans-naso-sphenoidal Route.*—Up to the present the author has induced anæsthesia by swabbing with a strong solution of cocaine and adrenalin followed by the application of strip of gauze impregnated with the same solution to the body of the sphenoid. Hirsch, of Vienna, supplements this method by infiltration of the pre-sphenoidal mucosa carried out by a needle curved upwards at its extremity; by these means he has been able to perform hypophysectomy by the nasal route.

II. *Bucco-pharyngeal Region:* (1) *Staphylorrhaphy.*—Here infiltration-anæsthesia is indicated. The injections must be made deeply over the surface to be operated upon.

(2) *Quinsy.*—Infiltration of both faucial pillars will usually suffice to render the opening of the abscess painless.

(3) *Tonsillectomy.*—Simple surface swabbing can only give derisive results. If infiltration be limited to the pillars, their separation and that of the tonsils becomes painless. To anæsthetise the gland itself, its deep surface innervated by branches of the glosso-pharyngeal must be attacked. A curved needle, with its point directed outwards, is passed between the base of the tonsil and that of the tongue. One then encounters the deep wall of the tonsillar recess, which is transfixed and the injection introduced. The operation can be undertaken five minutes later.

III. *Cervical region:* (1) *Tracheotomy.*—An intra-dermal injection is made over the line of incision; then several subcutaneous injections so as to produce an infiltration in front of the trachea, which one endeavours to distribute uniformly in every direction by massage. Anæsthesia is complete in ten minutes.

(2) *Endo-laryngeal Operation by the Buccal Route.*—Simple anæsthesia by swabbing or syringe is in most cases sufficient. In some refractory subjects this method may be supplemented by direct infiltration, or by regional anæsthesia of the superior laryngeal nerves.

(3) *Laryngo-fissure.*—The author's technique is as follows: (a) Intra-dermic infiltration in the median line from the hyoid bone to 3 cm. below the inferior border of the cricoid. (b) Infiltration of both superior laryngeal nerves. (c) Subcutaneous infiltration in front of and in contact with the larynx, so as to produce an infiltration which can be diffused in the soft parts by massage. (d) With the patient seated, the base of the tongue, epiglottis and laryngeal cavity are anæsthetised directly by Fournier's method to prevent reflexes when the larynx is opened. (e) As soon as the thyroid has been split, a strip of gauze

soaked in strong solution of cocaine and adrenalin is introduced and left some minutes in contact with the neoplasm.

(4) *Laryngostomy*.—Sargnon always operates, at least in adults, under local anæsthesia; so does Sieur (Val-de-Grace). The technique resembles that of laryngo-fissure.

Laryngectomy.—The application of local anæsthesia has lessened the mortality of this grave procedure. Ceci in Italy, Botey and Tapia in Spain, Moure and Bérard assisted by Sargnon in France have proved the possibility of performing laryngectomy under local anæsthesia. But as the patient is conscious the fear experienced by him may lead to inconvenience. To avoid this, perfect silence must be preserved during the operation, and the patient's eyes should be covered. One thus obtains complete insensibility, or very nearly so, especially if an assistant frequently touches the tissues with the strong anæsthetic solution.

(5) *Laryngectomy in Two Stages* undoubtedly avoids bronchopulmonary infection but does not prevent liability to collapse, in spite of serum injections, etc. The larynx is a highly differentiated organ, and its sensory supply may provide the afferent channels for inducing reflex medullary inhibition. Claud Bernard demonstrated that injury to the superior laryngeal nerve may paralyse respiration in a similar way to section of the medulla. Sensitiveness of the laryngeal mucosa is augmented under the influence of chloroform—a true medullary poison.

(6) *Deep Operations of the Cervical Region*.—Sargnon has reported several cases of deep abscesses of the neck and ligature of the jugular practised without pain under local anæsthesia, and considers that the method might be adopted in the case of Ludwig's angina, pharyngotomy and external œsophagotomy.

(7) *Removal of Goitres*.—Moure has by this method removed a sub-sternal goitre attended with grave syncopal symptoms (*Revue hebdomadaire*, No. 22, 1911).

Goris, for this operation, and all deep interventions on the neck, employs alypin, which he says does not depress the heart like cocaine. He uses a 1 per cent. solution with adrenalin, not exceeding 3 cgrm. of alypin. To suppress or lessen pain attending the extraction of diffuse goitre, Piquand, after the thyroid is exposed, makes a deep injection into each vasculo-nervous pedicle at the upper and lower poles of the organ. The whole of the thyroid and its aponeurosis are in this way anæsthetised.

IV. *Aural Region*: (1) *External Auditory Meatus*.—Anæsthesia of the cartilaginous meatus is practised for furunculosis, and for its enlargement during the radical mastoid operation. In the case of boils, the parts are first painted with Bonain's mixture. After some little time direct infiltration is performed, taking care to introduce the needle of the syringe, not at the summit of a boil, but at the border of the surrounding inflammatory infiltration. A pale zone is produced, and two minutes later the boil can be incised crucially and deeply.

(2) *Ossiculectomy*.—Here infiltration is combined with contact anæsthesia. In cases selected by the author for ossiculectomy, there is always a perforation through which the anæsthetic can be applied directly. Infiltration is practised with a small syringe provided with a needle, fixed at an obtuse angle in order not to hinder the view. After swabbing the portion of integument to be punctured with Bonain's mixture, the needle is introduced, not quite against the membrane (at this situation the skin is very thin and adherent, tearing at every attempt at injection), but about 1 cm. from it and at the junction of the posterior with the superior wall. Anæsthesia is complete in ten minutes.

(3) *Simple Antrotomy*.—Anæsthesia is very easy if the suppuration has remained intra-osseous and is not complicated by diffuse osteitis, but is more troublesome to attain if the inflammatory process has extended outwards, involving the soft parts, with purulent collections in the neck. Intra-dermic infiltration is carried out along the line of the retro-auricular incision. If there be no outward extension, deep injections are made down to the bone so as to produce a zone of infiltration corresponding in position with the area of osseous resection contemplated. In the event of outward extension, deep injections are made all around the border of the subcutaneous collection.

(4) *Radical Mastoid Operation*.—Here the methods of procedure are complex and special. One is for the most part called upon to intervene in children, with whom local anæsthesia will always remain an exceptional practice. It is, however, quite attainable, and ought to be proposed to patients when narcosis is likely to expose them to special danger. The author finally explained the advantages of local anæsthesia over a general anæsthetic; amongst these, the absence of surgical shock and rapid restoration of the patient are the most important.

MOURE (Bordeaux) said that anæsthesia of cavities obtained after the insertion of tampons impregnated with anæsthetic fluid is a very simple method which rendered interventions on the maxillary sinus extremely easy. The author has been able to remove the entire maxilla under local cocaine anæsthesia, the patient feeling nothing throughout the operation. For staphylorrhaphy he is not so enthusiastic; the operation should be performed at three years of age, and, in children at this period, subperiosteal injections of cocaine may lead to serious results. He prefers general anæsthesia. For tracheotomy, in thyrotomy local anæsthesia is an ideal procedure; he was, however, accustomed to remove the cannula at the end of the operation, and he wondered whether a field for subsequent infection by mucus and discharge was not created in the separation of the tissues by the cocaine solution. For laryngectomy local anæsthesia has not given him satisfaction: separation of the pharynx and œsophagus, division of the superior laryngeals and other steps of the operation have been very painful. He has tried Sargnon's method of infiltration with no better results. To obtain absolute anæsthesia strong solutions must be employed. He has performed antrotomies under cocaine, but the anæsthesia was not perfect; the same applied to interventions on the nasal bones. He has not tried the radical mastoid operation under cocaine, but wondered whether local anæsthesia would suffice, or might lead to secondary infection.

VACHER (Orleans) drew the attention of the meeting to the Gasserian ganglion, the source of the sensory supply to the face. He had induced anæsthesia of this region by injecting cocaine into the ganglion. The procedure was not difficult, and several routes of access are possible. One can penetrate by passing the needle to the pterygoid process, keeping close to the bone, or by freely exposing and hugging the inferior part of the notch, whilst passing up to the desired goal. The needle must be well directed in order to traverse Meckel's cave and flood the ganglion.

BROECKHAERT (Ghent) emphasised the necessity of endeavouring to obtain regional anæsthesia by dealing with the nerve-trunks, which enables a smaller dose of cocaine to be employed.¹ The integument of the nose is innervated by the infra-trochlear and naso-lobular branches of the nasal nerve and the nasal branch of the superior maxillary nerve. To anæsthetise this region the infra-trochlear will be treated by diffuse sub-

¹ See JOURN. OF LARYNGOL., RHINOL. AND OTOL., vol. xxvii, p. 524.

dermic infiltration. The naso-lobular and infra-orbital nerves can be directly injected, the landmark for the latter being just below the junction of the infra-orbital process of the malar bone with the maxilla. To anaesthetise the superior maxillary nerve the author adopts the orbital route. The needle is thrust through the conjunctiva just above the floor of the orbit and in close contact with the bone, till the sphenomaxillary fissure is reached; its point is then directed inwards and forwards for 4 cm., so as to encounter the nerve.

SARGNON (Lyons) utilises infiltration combined with regional anaesthesia as often as possible: when operating on cicatricial tissue infiltration is sufficient, though not perfect. The author employs novocaine for the skin, and a weak solution of cocaine for the deeper parts. In laryngectomy, regional anaesthesia of the recurrents must be practised to avoid the pain of detachment. The patient should be fasting in case necessity arises for the administration of chloroform. Local anaesthesia confers constant insensibility throughout the operation. The author has not tried local anaesthesia for operations on the sinuses; he has employed it for aural operations, ligature of the jugular and gastrostomy, and the results have been excellent.

JACQUES (Nancy) feared the psychological effect. It is, in fact, difficult for the surgeon to conceal his work. He also wondered, besides, if the systematic employment of infiltration anaesthesia would not lessen the resisting power of the tissues and their defensive power.

ABOULKER (Algiers): Six years ago he performed two extensive subhyoid pharyngotomies for epithelioma of the epiglottis, extending to the lateral walls of the pharynx, with local cocaine anaesthesia: 5-6 cgrm. of cocaine sufficed for both operations, which lasted one and three quarters to two and a quarter hours. During the past three months he had performed under local anaesthesia (Luc's method) three radical antral operations, a tracheostomy, resection of one half of the velum, two extensive laryngotomies, with division of the hyoid bone and clearing out of the larynx. Anaesthesia was very good. With Schleich's strong solution of cocaine he had cleared out the submaxillary fossa and carotid triangle with resection of the internal jugular. The operation took two hours.

Abstracts.

NOSE.

Parry, L. A.—A Case of Erysipelas Complicated with Meningitis following an Intra-nasal Operation; Recovery. "*Lancet*," September 30, 1911, p. 944.

The case was one of a healthy young man, aged twenty-seven, who four days after a submucous resection of the septum became suddenly ill, with a temperature of 105° F. From a slight intra-nasal inflammation he developed erysipelas, which involved the whole face. Maniacal symptoms, convulsions starting in the right hand and becoming general, conjugate deviation of head and eyes to right, strabismus, rigidity, loss of reflexes, and coma followed. Polyvalent anti-streptococcic serum in 10 c.c. doses was injected every six hours. Twenty-four hours later improvement began, and he became convalescent six weeks later. The author makes some severe strictures upon rhinologists who do intra-nasal operations

"for trifling defects," and although it must be admitted that they seem justified in some cases, one would like to hear this particular case discussed from the side of the operator.

Macleod Yearsley.

Neumayer, Prof.—Treatment of Nasal Asthma by Resection of Nerves
 "Zeitschr. f. Laryngol.," Bd. iv, Heft 3.

Many cases of asthma show no pathological change in the nasal mucosa, and for this reason Neumayer considers it better to cut across the reflex path. Of the two sensory nerves concerned—the olfactory and the trigeminal—the latter is much the more frequently involved. Neumayer then gives an account of the nerve supply of the nose. He thinks that the anterior ethmoidal nerve is the most important in connection with asthma, as it supplies the anterior end of the middle turbinal and septum. He has therefore confined himself to the resection of this nerve, and only operates upon cases in which cocaine application to the nose proves that the nose is the seat of origin. He reaches the nerve at the anterior ethmoidal foramen through the incision usually made in cases of external operation on the ethmoid. The nerve and vessels are exposed as they emerge through the orbital fat and divided between ligatures. The catgut is passed with the aid of a fine needle and tied by means of forceps. The proximal end of the nerve is sunk in the orbital fat and the distal end pushed into the foramen; the external incision is closed. He gives the history of five cases operated on in this way. Case 1 had had previous turbinal operations: resection of the left anterior ethmoidal nerve did little good; accordingly the right nerve was resected later. After the second operation the patient was much better although he still suffered from bronchitis. Case 2, boy, aged twelve, suffered from bronchitis and emphysema; cocaine experiment positive. Both ethmoidal nerves resected at one time; result, only one attack of asthma in three years. In Case 2 there was considerable hæmorrhage and bleeding occurred into the orbital tissues: the case was not benefited. In Case 4 there was a good result for a short time, but the condition recurred. Case 5 had been operated upon for too short a time to note the result. The cosmetic result of the operation was good in all instances. Neumayer notes that the sensibility of the nasal cavities was diminished, but not destroyed, in the region of the septum and middle turbinal interiorly.

J. S. Fraser.

Haas.—Connection between Nasal Disease and Dacryocystitis. *Recueil oto-rhino-laryngologie*, No. 2, 1910.

The lachrymal sac and canal lie in an osseous canal, the internal surface of which corresponds to the anterior part of the middle meatus of the nose and to the anterior ethmoidal cells, hence the difficulty of distinguishing between the ethmoiditis and the dacryocystitis; and often the suppurative ethmoiditis may infect the lachrymal sac. There is a close connection between the venous network of the canal and sac and that of the turbinates and the ophthalmic vein, while there is a similar intimate connection between the lymphatic system of the lachrymal and nasal mucosa; thus half the cases of lachrymation have a nasal origin, traceable to deviations of the septum, chronic rhinitis, mucous polypi or similar conditions obstructing or infecting the lachrymo-nasal duct in some part of its course. While this is the case, it is exceptional that the infection passes from the sac to the surrounding ethmoidal labyrinth. Lachrymal suppuration from a maxillary antrum is very frequent, and frequently results from tumours of this and of the ethmoidal region.

Ozæna and syphilitic lesions of the nose frequently affect the lachrymal apparatus, while tuberculosis of the lachrymal passages is almost entirely secondary to an ascending tuberculosis from the nasal mucosa.

J. D. Lithgow.

Schlemmer, Fritz.—**Partial Bilateral Occlusion of the Choanæ by a Congenital Retro-nasal Transverse Fold.** "Monats. f. Ohrenheilk.," Year 46, No. 9.

The case occurred in a woman, aged forty-four, who had had four normal pregnancies and no miscarriages. She could not state when her troubles definitely commenced, but for the last four years or so she had suffered with chronic "colds," frequent attacks of "influenza," and some severe headache chiefly on the left side, with rheumatic pains in her limbs. During this period the nose had been "stopped up," but she had only now considered this of sufficient importance to seek advice.

Examination showed a condition of atrophic rhinitis with ozæna and muco-purulent secretion, more pronounced on the left side, on which the antrum was also implicated. An easy view was obtainable of the nasopharynx from the front, where an uneven, irregular band could be seen stretching across from one Eustachian cushion to the other. Posteriorly the choanæ were symmetrical and unobscured, except where the band crossed about their middle.

The origin of the condition was either congenital, the result of scleroma, or syphilitic. Against syphilis was the history and a negative Wassermann, and no support could be found to the view that it might be due to scleroma.

A Caldwell-Luc operation was performed on the left antrum, and the "band" removed with a conchotome and cold snare.

Histological examination revealed a tissue resembling adenoids, thickly beset with lymph-follicles, which thus very strongly suggested its probable congenital origin, since, as Chiari had pointed out, glandular tissue was never found in scar-formation.

The patient regained complete nasal respiration, and under treatment the crusting, etc., ceased. The author has been able to find only one report of a similar case.

Alex. R. Tweedie.

EAR.

Beck, J. C.—**Contribution to the Pathology and Treatment of Otosclerosis.** "Annals of Otol., Rhinol., and Laryngol.," xxi, p. 203.

Being much impressed by the similarity in the bony changes of osteomalacia and otosclerosis, the author has been using hyperdermic injections of adrenalin. The technique used is described. Eleven cases were experimented upon. In no advanced case was there any result as to hearing, but in one tinnitus ceased. Three cases, less advanced in type, improved in hearing.

MacLeod Yearsley.

Braun, A.—**Deep Temporal Abscess.** "Annals of Otol., Rhinol., and Laryngol.," xxi, p. 170.

Describes three cases of deep temporal abscess (under the temporal muscle), and discusses pathology and treatment. A good exposition of a little-described condition.

MacLeod Yearsley.

Sugár, Martin (Budapest).—The Works of the late Prof. Andreas Högges on "The Nervous Mechanism of Associated Eye-movements." "Monats. f. Ohren.," Year 46, Nos. 6, 7, 8, 11 and 12.

Although many allusions to these investigations are to be found in German literature, the author considers the original report to be of so great interest and importance as to merit a verbatim translation from the Hungarian articles first published in the *Annals of the Budapest Academy of Science* in 1881. This account, which Sugár prefaces with a short biographical sketch, forms the only authorised German version of a most orderly, elaborate, and accurate report on the functions of the semi-circular canals and associated nystagmus.

The story of the research and its results commences with a long introduction explanatory of the initial observations, which apparently induced Högges to pursue his studies in this direction, and thus led up to his attempts to elucidate the origin and meaning of these phenomena by experimental research on animals. Reference is first made to the normal co-ordinate movements of the eyes in the varying positions of the head, and the relation of these movements to the various central nuclei. The observations and opinions of other writers thereon are carefully weighed and compared with his own, which he is thus able to support by the help of facts gleaned from his experiments.

These latter at first were directed towards the accurate observation of the results of rotation on rabbits, and it is somewhat surprising to find a most clear illustration of the mechanical device used for not only carrying this out, but also for accurately and graphically recording on a drum the resulting nystagmus, some charts of which are included. Most detailed notes were taken of both stimuli and their effects. Indeed so exhaustive and convincing is the whole work that one cannot help wondering how the knowledge of this research and its immense clinical importance took so long to become disseminated throughout the otological world.

With this physiological foundation Högges then proceeded to perform various destructive lesions of the brain and cerebellum, and to note how the "normal" reactions then varied. His conclusions at this stage may be quoted as an instance of the clear character of the work, and of how facts noted were marshalled as he progressed:

"1. The compensatory or passive associated eye-movements remain unaffected after destruction of (1) The optic nerves; (2) the cerebral hemispheres and great basal ganglia; (3) the optic thalami; (4) the anterior portion of the corpora quadrigemina; (5) the spinal cord up to the level of the auditory nerves.

"2. They are completely lost under the following circumstances: (1) If the oculo-motor muscles or nerves are completely divided; (2) if a destructive lesion is performed in the middle line between the middle of the anterior quadrigeminal bodies and the nuclei of the eighth nerves; (3) if the upper part of the floor of the fourth ventricle is divided in the middle-line; (4) if the eighth nerve on each side is divided; (5) if the membranous labyrinth on each side is divided.

"3. The eye-movements are affected more or less up to complete cessation by (1) division of one optic nerve; (2) extirpation of a hemisphere, optic thalamus, and anterior part of the anterior corpora quadrigemina; (3) unilateral longitudinal and transverse division of the floor of the fourth ventricle; (4) unilateral destruction of the membranous labyrinth or eighth nerve."

Next, the effect of various stimuli under artificial conditions were then investigated and summarised, and then the whole series of experiments having been passed in review, the first part of the paper terminates with the conclusions at which the author then arrives. These consist in a relation of the various anatomical parts, the integrity of which Högyes states is essential for the appearance or production of these "involuntary associated movements of the eyes," supported by detailed references to the results of his experimental research.

Two other parts follow in which further experimental work is described and deductions drawn therefrom. The article concludes with a diagrammatic scheme illustrating the source, route, and result of various stimuli.

In addition to the very large amount of time he must have spent in evolving the data on which his account is based, allusions to over forty works in Hungarian, French, Dutch, German and English bear ample testimony to Högyes' untiring efforts to unravel the intricacies of his subject.

To give an adequate abstract of such a work is impossible, and the attempt would be but a poor tribute to its value and the labour it represents. Although those interested in it may find nothing that now is not well known, still it is well worth reading if only from an historical point of view, nor can they help being astonished that a quarter of a century was to elapse before the clinical significance of these experiments came to be generally recognised—and that mainly through the agency of Bárány and the Vienna School.

A. R. Tweedie.

Shambaugh, Geo. E.—On the Origin of Compensatory Tonus after Destruction of the Labyrinth. "Annals of Otology," etc., xxi, p. 697.

Compensatory impulses that develop after the destruction of a labyrinth and which restore the disturbed balance in equilibrium may have two sources. One is the compensatory increase in those tone impulses from the remaining labyrinth which direct nystagmus to the opposite side. But it is clear that in most cases the restoration of equilibrium is accomplished by a compensatory tonus which, in part at least, is developed independent of the opposite labyrinth. Shambaugh cannot accept the view that automatic tonus centres exist in Deiter's nucleus. The restoration of the normal extra-labyrinthine tonus is not sufficient to restore the disturbed equilibrium due to unilateral loss of labyrinthine impulses. Its place must be supplied by the development of an additional tonus, developed chiefly from the extra-labyrinthine impulses. It is only in cases of long-standing destruction of one labyrinth where the compensatory tonus from the remaining labyrinth supplants completely this compensatory extra-labyrinth tonus.

The restoration of equilibrium which follows the destruction of both labyrinths is never a complete restoration of the normal equilibrium.

Macleod Yearsley.

PHARYNX.

Sigmund, Marx.—("On Reflex Cough," etc.) Pharyngeal Cough and its Treatment. "Zeits. fur. Ohrenheilk.," vol. lxx, Part IV.

The writer records eight cases in which, by treatment directed to the tonsils, he was able to entirely relieve a distressing convulsive cough.

The character of the cough is that it occurs in attacks day or night, in the intervals of which the patient is free except for slight clearing of the throat. At the height of the attack copious watery secretion may flow from the eyes and nose; usually very little expectoration. The cough is frequently initiated by hot or cold drinks, changes of temperature, laughing, etc. In all such cases the tonsils should be carefully inspected, not only by depressing the tongue, but by drawing the anterior pillar forwards with the Killian hook. Frequently this examination will cause an attack of coughing, or at times only when certain crypts of the tonsil are probed is the reflex provoked, and occasionally only when certain very circumscribed areas are examined. It is important not to confuse the swallowing and retching which occurs in many on disturbing the tonsils with the true convulsive cough. The treatment consisted in finding such crypts in the tonsils as were occluded by plugs and slitting them up. The small operation could not always be completed at one sitting, and in some cases solutions of silver nitrate were applied to the bottom of the crypts after slitting. The superficial use of the guillotine is useless, as the deeper portions of the lacunæ are still left; complete enucleation of the tonsil is regarded as rather too severe a procedure, but might be necessary when the simple process of slitting up the crypts had failed.

Lindley Sewell.

REVIEWS.

The Medical Annual: A Year-Book of Treatment and Practitioner's Index, 1913. Bristol: John Wright & Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent & Co. New York: E. B. Treat & Co. Toronto: The J. F. Hartz Co., Ltd. Calcutta: Thacker & Co. Bombay: Thacker & Co. Melbourne, Sydney, Adelaide and Brisbane: G. Robertson & Co. Sydney: Angus & Robertson, Ltd. New Zealand: Whitcombe & Tombs, Ltd. (871 pages.)

"Age cannot wither her, nor custom stale her infinite variety," as said of Cleopatra, may be said without any great exaggeration of *The Medical Annual*. The last issue keeps well in line with its predecessors as regards freshness and fulness.

The special branches with which we are mainly concerned have been entrusted this year to Prof. Chevalier Jackson and Dr. George L. Richards, both of whom are well known to our readers.

Among the communications emanating from other than oto-laryngological specialists we find reference to Pirie's advocacy of X-ray examination of the temporal bones, which seems to assume a symmetrical condition as normal. Cheatle has shown that there are frequent exceptions to this rule. Abbe's cures of recurrent papillomata in the larynx by means of radium (p. 67) will interest our readers. J. J. Perkins, in his report on asthma, quotes Ephraim's reiteration of the value of adrenalin and his bronchoscopic observations on its action (p. 115). Ruttin's reference to ligation of the internal jugular as giving, in the presence of sinus thrombosis, the highest percentage of optic papillitis is interesting (p. 211), as also Beck's observations on the treatment of otosclerosis by means of adrenalin (p. 216). The writings of British as well as American workers receive considerable attention in regard to the larynx as well as the ear. A valuable paper on "Strictures of the Oesophagus," by Walker Downie, is reported in an extensive abstract (p. 367). Charles A. Clark's paper on "The Need of X rays in the Diagnosis of Oral Sepsis" contains a

very disturbing indictment of "bridges" and "crowns" in dental work (p. 371).

The articles on the advances in the various branches of medical science are so clear and so well selected that even the most exclusive of specialists is readily led to peruse them, and so get into touch again with those medical subjects from which his special studies have drawn him away. For the specialist nothing could be more desirable than such an annual revision, while for the general practitioner it is indispensable.

Dundas Grant.

John and Elizabeth. By JAY GEE. Preston: Geo. Toulimer & Sons, Ltd., 1912.

In the "Jay Gee," who thus makes his *début* as a writer of "fiction with a purpose," we believe we recognise the well-known and respected head of a certain institution for the deaf in the Midlands. We welcome his "romance of real life" as calculated to increase public sympathy for, and interest in, a very important class of the community. The purpose of the novel as set out in the preface, is that of showing the great dangers of hereditary deafness, but we have found in it another and equally important one—a demonstration of what can be done for the deaf by education. In this connection, note must be taken of the sympathetic character sketch of Thomas Arnold, the head of the school for the deaf at which the heroine is educated.

Briefly, the story is of the love of a bank clerk for his chief's daughter, the congenitally deaf Elizabeth. His wish to marry is beset by the fear of deaf offspring, and the chapter which concerns us most from the medical point of view is that in which John discusses the question of hereditary deafness with Arnold. This chapter is excellent upon the whole, and emphasises the very vague ideas which general practitioners seem to have as to the nature and causes of severe deafness in children. There are, however, certain points to which we take exception. It cannot be said that there is as yet any proof that the occurrence of sporadic cases of congenital deafness presupposes the presence of a "taint" or "degeneracy" in the family or that the defect is likely to be transmitted. With a subject of so wide and far-reaching a nature—a subject which is still so much *sub judice* that the most expert of its observers scarcely dare to venture more than a few tentative suggestions—it is most unwise to offer statements as dogmatic as are some in this volume. At the same time we welcome the little romance as drawing the attention of the lay public not only to the question of deaf-mutism, but to the enormous patience which enables that noble and self-sacrificing army, the teachers of the deaf, to achieve the brilliant results which those who work amongst deaf children know to be a fact.

Macleod Yearsley.

BOOKS RECEIVED.

Practical Guide to Diseases of the Throat, Nose and Ear, for Senior Students and Junior Practitioners. By *William Lamb, M.D., C.M. Edin., M.R.C.P. Lond.* Third Edition. London: Baillière, Tindall & Cox, 1913.

Die Ermüdung der Stimme (Phonasthenia). Von *Dr. R. Imhofer*, Prag. Würzburg: Curt Kabitsch, 1913.

Verletzungen des Ohres bei Katastrophalen Explosionen. Von *Dr. Ignaz Hofer* und *Dr. Oskar Mauthner*. Mit 3 Tabellen und 1 Kartenskizze. Wien und Leipzig: Joseph Schar, 1913.

THE
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**THE OPERATIVE TREATMENT OF PITUITARY
TUMOURS.**

ALTHOUGH the site of pituitary tumours is, not merely metaphorically, but actually, almost within touch of the rhinologist's territory, it is only within the last three or four years that the nasal specialist has begun to take more than a perfunctory interest in this little region. The reason for this neglect is, of course, that pituitary disease rarely causes symptoms with which the rhinologist is called upon to deal. It is true that long before the days of radiography StClair Thomson had postulated pituitary tumour as a common cause of an uncommon disease, viz. cerebro-spinal rhinorrhœa, and that epistaxis and anosmia are also occasional symptoms of pituitary tumour. But the fact remains that pituitary lesions do not arrest the attention of the rhinologist as they do that of the ophthalmologist, for instance, when they interfere with vision, or that of the neurologist when they induce a rise in intra-cranial pressure, or that of the general physician when they cause errors in metabolism.

Thus operations upon tumours of the pituitary body when first they were attempted were quite naturally performed by the general surgeons attached to the neurological clinics, and they, quite as naturally, selected as their route of access the subtemporal or sub-frontal craniotomic approach. To Paul of Liverpool belongs the merit of having been the first to carry out Horsley's original

suggestion of sub-temporal decompression, which operation, with or without partial extirpation, was for a time the only one resorted to for the relief or arrest of increasing visual impairment due to the pressure of the pituitary tumour upon the optic tracts or commissure. Of late, however, while decompressive craniotomy is still the recognised mode of relieving general increase in intra-cranial pressure, on the other hand, where local pressure symptoms, visual for the most part, are the most obvious and urgent features in the case, the less serious operation by the nasal route has largely become the operation of choice, in the first instance at all events.

The possibility of relieving the local pressure effects of a pituitary tumour by operating through the sphenoidal sinus was first suggested by Giordano as far back as 1897, but the suggestion was not put into practice until 1907, when Schloffer's enterprise marked a new epoch in pituitary surgery. This operator carried out an extensive exenteration of the frontal, ethmoidal and sphenoidal sinuses, together with partial removal of the sellar floor, after displacement of the nose downwards by Ollier's external incision.

The palato-sphenoidal route, which is the route followed in experimental operations on the lower animals, was proposed, as a method of operating on the human subject, by König in 1900, and first carried into effect by Ballance in 1909, but his patient unfortunately died from hæmorrhage without having regained consciousness. It is interesting to note that efforts, as the paper by Broeckhaert in the present issue shows, are now being made to revive this procedure which had fallen into disuse.

The gradual elimination of the unnecessary features in the extensive exenterations of the Schloffer type of operation need not here be traced out in detail, as they can be gathered by an examination of the illustrated tabular scheme on p. 363 *et seq.*, but great credit must be given to Von Eiselsberg for popularising a form of this upper rhinotomic operation which, besides being less mutilating, showed the natural advantages provided by the nasal septum as the guide to the seat of the disease, without opening the frontal and ethmoidal cells.

The next step must be associated with the name of Halstead, who adopted the lower rhinotomic displacement of Rouge as the initial step in the approach by way of the nasal septum. This method has been extensively and successfully practised by Cushing, who combines it when necessary with a bitemporal decompressive craniotomy. Cushing's brilliant monograph is dealt with elsewhere.

Last and by no means least the endo-nasal work of Hirsch of

Vienna, dating from 1909, demands special attention from us, since it is here for the first time that we find the rhinologist taking a hand in pituitary operations. It is obvious that an expert nasal operator is likely to start with some manipulative advantages over the general surgeon in the performance of Hirsch's operations by the endo-nasal route, involving as they do such highly technical work as submucons resection and sphenoidal sinus exenteration. For this reason the endo-nasal operation is not likely to find much favour in the eyes of the average general surgeon. Furthermore, although the neatest and least destructive of all pituitary operations, Hirsch's method is open to the objection that it selects the longest route of approach, and in its final stages it supplies us with but a cramped and restricted area of exposure.

On the other hand, seeing that the subjects of pituitary disease are usually far from ideal patients for operation, there are obvious advantages in selecting the endo-nasal method, by which the end in view can frequently be obtained with a minimum amount of shock, hæmorrhage and operative interference. Indeed, as Hirsch has demonstrated, the operation can be performed under local anæsthesia, and in separate stages, if need be. So that, even if a larger craniotomic interference should ultimately prove to be necessary, it may nevertheless be to the patient's benefit to entrust the primary operation through the nose to the practised hands of the rhinologist, who would thus divide with the general surgeon the responsibility for the operative treatment, just as the ophthalmologist, the physician and the radiographer co-operate for the purposes of diagnosis and medical therapy.

The treatment of tumours of the pituitary body is, of course, at present only in its infancy. What the future may have in store in the direction of improved methods of organo-therapy, of radio-therapy, and even of new surgical technique one cannot foresee. But it is worth while drawing attention to Cushing's confident expectation that operation on pituitary tumours by the nasal route will come to be as safe as the operation for the removal of the Gasserian ganglion now is in competent hands. Operative risks are diminishing, and results of a palliative nature are increasing. But when we come to consider the ultimate fate of those suffering from these and other brain tumours, our optimism is dashed by the reflection that at the present time the prognosis as regards the complete and permanent recovery of these patients is not in the least promising, even after the most skilful operative measures (see p. 362).

Wm. Hill.

A CONTRIBUTION TO THE SURGERY OF THE HYPOPHYSIS.

BY DR. JULES BROECKAERT,
Ghent.

Translated by CHICHELE NOURSE. F.R.C.S. EDIN.¹

THE surgery of the hypophysis cerebri, although a development of quite recent date, has been, from its very commencement, a subject of keen interest to rhinologists, to whom the idea of operating on the pituitary gland by simple methods, carried out through the natural passages, immediately occurred.

In opposition to surgical procedures through artificial routes, Citelli, West, and Hirsch have accordingly proposed rhinological methods which, according to their authors, have a real superiority over those of general surgeons.

I desired to ascertain for myself the comparative value of each of these procedures; and, with this intention, I performed a certain number of operative exercises, the result of which is here made known.

Anatomical Facts.

The hypophysis or pituitary gland is an organ attached to the lower surface of the cerebrum by a narrow pedicle, the stem of the hypophysis, and enclosed in the sella turcica between the laminae of the sphenoid and the two cavernous sinuses. It occupies a fibrous compartment, the roof of which is composed of a diaphragm or fold of dura mater, known under the name of the pituitary tentorium; in the anterior and lower part of the dural investment a venous plexus, connected with the anterior coronary sinus, is met with.

The gland is composed of an anterior lobe, by far the larger of the two, called the hypophysis proper, and of a posterior lobe also described under the name of the nervous or cerebral lobe. The first is developed from a diverticulum of the superior wall of the primitive buccal cavity; the second is a protrusion of the floor of the middle ventricle from the inferior surface of the brain (Charpy).

The sella turcica, upon which the pituitary gland rests, normally forms a part of the superior wall of the sphenoidal sinus; and is, from a surgical point of view, one of its most important relations. The thickness of this wall is usually very slight, and in certain cases there are even actual dehiscences at this point, which allow

¹ From *La Presse Oto-Laryng. Belge*, July, 1912.

a perfect cohesion of the mucous lining of the sinus and the dural investment.

When the sphenoidal sinus is very large, the convex base of the sella turcica often forms a prominence in the cavity of the sinus. It is at the back, on a line with its sloping part, that the osseous vault of the sinus is in relation with the pituitary gland; in its anterior part, the superior wall of the sphenoidal cavity is in relation with the inferior surface of the first frontal convolution.

However, as Levinger has observed, and as I have been able to convince myself in the course of my researches upon the cadaver, the position of the sella turcica in relation to the sphenoidal sinuses is most inconstant. Thus, on a preparation in my possession, the hypophysis is in the centre of the roof of the sinus, which is prolonged far downwards and backwards.

At other times, as I have observed in several specimens, the sphenoidal sinus is smaller than usual, and is separated from the sella turcica by a very thick bony wall.

In certain cases the sphenoidal sinus is found to lie very forward, and the sella turcica is lodged in the thickness of the bone, behind the sinus cavity.

Finally, I must mention the relative frequency of a large ethmoido-sphenoidal cell, which is found between the sphenoidal sinus and the base of the cranium. In such cases, as Furet has observed, the roof of the sinus is no longer in relation with the cranial cavity, but is formed by the floor of this intruding cell.

It must be borne in mind also that the sphenoidal sinus is divided in two by a septum, which is never, so to speak, situated in the median line. The most varied arrangements are met with here, so that it may be stated with Jacob that "inequality is the rule." These two unequal cavities, of an irregularly cuboid form, are situated between the nasal fossæ and the basilar process in one direction, and between the base of the cranium and the pharynx in the other. Their anterior wall forms the remotest part of the nasal vault, and is a prolongation from the cribriform plate of the ethmoid. Its direction is slightly inclined from above downwards, and from before backwards, and it is continuous with the inferior wall, of which the external surface corresponds to the naso-pharyngeal region.

The anterior wall presents a free surface in the nasal fossa, on each side of the median line, and, external to this, a rough surface, larger still, hidden by the posterior extremity of the ethmoidal labyrinth.

Operative Methods.

The hypophysis can be approached either by the intra-cranial route or by the extra-cranial route through the sphenoidal sinus; hence there are two methods of hypophysectomy—intra-cranial hypophysectomy and trans-sphenoidal hypophysectomy.

I will not dwell upon the intra-cranial operation, which can be performed by the temporal or by the frontal route. This method is open to so much serious criticism that, in the immense majority of cases, if not invariably, the extra-cranial methods should be preferred as being much more logical and practicable.

Giordano was the first, in 1897, to recommend removal of the hypophysis through the trans-sphenoidal route, by directly attacking the floor of the sella turcica. However, the first operation of this kind was not performed until much later, when Schloffer, in March, 1907, successfully removed an adenoma of the hypophysis by this method.

The most diverse routes have been suggested in order to reach the sphenoidal sinus. Some of these have no practical interest, and seem hardly applicable to the living subject. We may thus dismiss the pharyngeal route, proposed by Loewe, and also the maxillary route. These cadaveric operations are undoubtedly too mutilating, and may be resolutely set aside.

The palatine route, formerly proposed by König, and long made use of in physiological laboratories, was followed twice on the living subject by Durante and by Stewart and Ballance. It is a mode which attracted me from the outset of my exercises on the cadaver, and which I carried out as follows:

The velum of the palate, rendered tense by holding the uvula with a pair of forceps, is divided completely by a median incision which is prolonged forward under the osseous palate half way to the incisor teeth. By the aid of a raspator the muco-periosteum is then detached in two flaps, which must be carefully loosened at the posterior edge of the hard palate.

In order to keep apart the two halves of the divided velum, a thread is passed through each half of the uvula, and the ends fixed outside the mouth.

The horizontal plate of the palate bones is then removed with bone-forceps. The posterior part of the septum remains to be dealt with. A strong pair of gonge-forceps will serve to undermine the septum, and to cut away little by little the hard vomer.

Then the sphenoidal sinus is opened with a gonge and mallet in

the median line, from its antero-inferior aspect, by destroying the bifurcated edge of the vomer and the crest of the sphenoid.

The sphenoidal sinus being freely opened, the situation of the posterior and superior aspects of the sinus must be ascertained exactly, and the septum separating the two sinusses is taken away. The convexity of the floor of the sella turcica, near the posterior limit of the sinus, is then attacked with a narrow chisel.

The opening is enlarged in breadth to the extent of more than one centimetre, sufficient to permit the introduction of the forceps and curettes designed to remove the hypophysis or the tumour.

We must insist upon the necessity of opening the superior wall of the sinus exactly in the median line: all the landmarks should be carefully determined, and it is only when this has been done under the control of artificial light that the operator will proceed with great delicacy to open the pituitary chamber.

Partsch has proposed, as a palatine route, a temporary displacement downwards of the whole of the bony palate. The same operation was undertaken by Löwe, who advised a combination of the temporary downward displacement of the palate with decortication of the face. These procedures appear to me very inferior to that which has just been described, and even to those which frankly make use of the nasal route.

The nasal route is that which so far has been preferred by operators. Out of fifty-four hypophysectomies collected by Toupet, thirty-three were performed in this way. But in order to reach the sphenoidal sinus by this route, what varied procedures have been suggested! All the modes of temporary rhinotomy have had their partisans among general surgeons, whilst rhinologists have set aside all the artificial routes in order to confine themselves exclusively to the natural passages.

A. Methods by Artificial Routes.

Access to the nasal fossæ has been studied by the median route, by the lateral route, by the superior route, and by the inferior route.

Proust and Lecène consider that Ollier's vertical and bilateral osteotomy is the operation of choice. Schloffer, von Eiselsberg, and others prefer the lateral reflection of the nose by the method of von Bruns and Moure.

Besides these methods generally followed, allusion must be made to that of the American Kanavel, who turns the external nose upwards by a U-shaped incision; and to that of Dialti, who

proposes a single dorsal incision dividing the nose from top to bottom in the median line, so that it can be opened in two flaps. Whatever may be the method adopted to gain access to the nasal fossæ, it is completed by evacuation of their contents.

This important stage of the operation consists in resection of the ethmoid, of the septum, and of the inferior and middle turbinals. The whole of the upper part of the nose is thus completely cleared. Schloffer, von Eiselsberg, Proust and others do not resect the nasal septum completely, but take care not to interfere with its posterior border, so as to leave intact the posterior orifices of the choanæ, and to respect the articulation of the vomer with the sphenoid.

Several operators follow the rhinotomy by the ablation of the anterior wall of the frontal sinus, so as to facilitate access to the higher part of the nasal cavity, and to get nearer to the sella turcica. I agree with Kocher, Goris and others that this is an absolutely useless complication of the operation, which may very well be omitted.

When the rhinotomy has been performed by one of these methods and hæmorrhage has been checked, the operator proceeds to make a large opening into the sphenoidal sinus and to trephine the sella turcica.

The exact situation of the sphenoidal sinus is generally recognised by the two openings by which it communicates with the nasal fossæ. The anterior wall is then opened with the curette or the chisel, and the septum is destroyed with cutting forceps.

When all bleeding has ceased, and when the median line has been exactly localised, the sella turcica can be opened and the dura mater laid bare. In acromegaly and in cases of tumour of the hypophysis, the thinned wall often bulges into the sinus and can be opened by a stroke of the curette; at other times it is necessary to attack the postero-superior wall of the sinus with a gouge, "resting the handle," as Schloffer advises, "upon the lower edge of the nasal fossæ."

We need not dwell upon the later stages of the operation; the incision of the dura mater, and the extirpation of the hypophysis or the ablation of the tumour. Here the operator must be guided by the peculiarities of each case, and it must not be lost sight of that many tumours of the hypophysis are really cysts which only require to be punctured or incised.

For the removal of a diseased hypophysis or of a tumour a dull curette with a malleable handle is to be preferred.

B. *Methods by Natural Routes.*

Hirsch, West and Citelli have sought to reach the hypophysis by opening the sphenoidal sinns through the endo-nasal route. Their methods are based on the same principle, that of opening the sphenoidal sinns and the sella turcica in the median line without a preliminary rhinotomy.

(1) *Hirsch's Method.*—To Hirsch belongs the merit of having performed the first hypophysectomy by the endo-nasal route. The procedure adopted by the Viennese operator was that indicated by Hajek for making a free opening into the sphenoidal sinus. In spite of the successful result of this operation Hirsch has since given up the method he then followed, which required several sittings and which had serious drawbacks.

Since then, Hirsch proposed and has performed several times the following operation, which was suggested to him by that of Kocher. The latter opened the superior osseous part of the nose like a double door, by a Y-shaped incision, of which the vertical part followed the dorsal line, and the two oblique branches divided the nose below the nasal bones. He then performed a submucons resection of the whole of the nasal skeleton, and opened the sphenoidal sinns and the sella turcica between the two blades of a strong speculum, which separated the two layers of mucons membrane and crushed the lateral masses of the ethmoid.

Hirsch practises, under local anæsthesia, submucons resection of the whole of the nasal septum, very nearly according to Killian's classic operation: thus he removes the quadrangular cartilage, the perpendicular plate of the ethmoid, the vomer, and the crest of the sphenoid. By carefully detaching the mucons membrane of the anterior wall of the sphenoid, he brings clearly into view the two sphenoidal ostia. The middle turbinals are removed if necessary; after which, through the tunnel obtained by separating the two layers of the mucons membrane of the septum by means of a Killian's speculum, he opens both sphenoidal sinnses in the median line with a gouge, destroys their septum with cutting forceps, and breaks through the wall of the sella turcica.

(2) *West's Method.*—The technique that West has described in the *Archiv für Laryngologie* is the following:

(a) Resection, on one side, of the middle turbinal and of a more or less extensive part of the inferior turbinal, so as to expose the anterior wall of the sphenoidal sinus. Ablation of the anterior wall of the sphenoidal sinus.

(b) The same proceeding on the other side.

(c) The formation, by the aid of Jansen's forceps, of a long rectangular window in the nasal septum. This opening extends obliquely from behind forwards and from above downwards, from the antero-inferior surface of the body of the sphenoid nearly to the columella.

(d) Resection of the septum between the sphenoidal sinuses, and opening the base of the sella turcica in the median line.

(3) *Citelli's Method*.—At the same time that West's work appeared Citelli made known his own method of operating, which is similar to that of his American *confrère* in nearly every point.

In a first *séance*, Citelli removes the anterior third or half of the inferior turbinal, the middle turbinal, and the inferior ethmoidal cells of one side, in such a way as to expose to view nearly the whole of the anterior wall of the corresponding sphenoidal sinus and the anterior part of its inferior wall. Then, with a sharp-pointed knife, used for intra-nasal operations, he perforates the septum opposite the posterior part of the perpendicular plate of the ethmoid. Through this opening, with a pair of punch-forceps, he then removes the posterior extremity of the perpendicular plate, the crest of the sphenoid, and the superior angle of the vomer, with the adjoining part of its posterior border.

Citelli is thus content to make a small window one centimetre square, in the nasal septum, through which, in a second *séance*, he proceeds to open the sphenoidal sinuses. The opening made in the two sinuses is then enlarged with a chisel or forceps, by opening more freely the sinus corresponding to the nasal fossa through which the operation is conducted, and as much as is necessary of the septum between the two sinuses is removed.

Choice of Operation.

The different routes which have just been described all present the same drawback, namely, the great distance between their starting-point and the sella turcica at which they terminate. It is for this reason that it is so necessary to illuminate the field of operation, and to select a route which will give a sufficient exposure, while confining the mutilation to a minimum.

It is best not to pronounce *à priori* in favour of one or other of the rhinological methods. While it must be recognised, on the one hand, that we rhinologists succeed in attaining considerable skill in performing operations in narrow and deep localities, it is no less true that in this case a procedure should be selected which

gives a sufficient exposure, and which is likely to lead to the best results.

Now, a rhinotomy is not such a difficult or disfiguring operation that it must necessarily be set aside in favour of intra-nasal methods, when it is a question of facilitating an operation as serious as hypophysectomy. It is thus that the transmaxillo-nasal route, made popular by Moure, has aided to a remarkable degree the performance of certain operations on the ethmoid and on the cavum. Why, then, should we judge otherwise when the object is to attack the sphenoid, and to open in the depth of the sinus the sella turcica, on which the hypophysis rests?

Moreover, in order that a method of hypophysectomy should meet with our approval, it must also allow of working in the median line, and an approach to the sphenoidal sinus exactly in the middle and not from one side. It is for this reason that the original method of Hirsch, having the great drawback of necessitating the lateral opening of the sella turcica, was distinctly bad. By straying ever so little from the median line there is a danger of injuring the cavernous sinus or the internal carotid, and the extraction of the tumour is rendered almost impossible.

One method, which I hope to re-establish, is the transpalatine method mentioned above. The resection of the vault of the palate and the opening of the sinus through its antero-inferior wall greatly facilitate access to the sella turcica, which can thus be approached from below upwards, and not by following a parallel plane, as is often the case in following the nasal route. This way, which, moreover, is much shorter than the nasal route, gives a free exposure, and the artificial light, which must always be used, can here strike directly on the site of the hypophyseal cell.

It is, in fact, the road which leads directly to the superior wall of the sinus, at least in the generality of cases, and which best permits finding the bearings.

If a number of median sections or radiographs of the human head are examined it will be observed that there are cases in which the relations between the sella turcica and the sphenoidal sinus are such that the nasal route seems unfavourable for hypophysectomy, while the trans-palatine route would lead directly towards the sella turcica. In others, however, serious difficulties would interfere with the approach to the sella turcica through the palate. It follows that radiography is of the greatest importance here, and that no operation on the hypophysis should be undertaken without having examined beforehand whether the anatomical dispositions

will permit access to the cell containing the hypophysis by the route which it is proposed to follow.

The trans-palatine route, which constitutes the method of selection when the nasal or intra-nasal route is unsuitable, is hardly mentioned in the works upon the surgery of the hypophysis in spite of the great success which Durante obtained by it. I am convinced that its advantages, in many cases, are not merely theoretical but real. I believe that this route is capable of giving excellent results; all the more so as it is within the capability of every surgeon, which is not always the case with the intra-nasal route.

Quite recently, Prof. Preysing, of Cologne, operated by this method in a case of tumour of the hypophysis, and he was able to verify the relative ease of this mode of operating.

If statistics alone were consulted, the intra-nasal method of Hirsch would appear far superior to all the others. In fact, according to Toupet, who has collected fifty-four cases of extra-cranial hypophysectomy, the nasal route carries a total mortality of 48 per cent., while the intra-nasal method only entails a mortality of 13 per cent. It must, however, be remarked that the intra-nasal method, which was employed altogether fifteen times, was practised in fourteen of these cases by Hirsch, who had only to register two deaths. But, as Toupet very judiciously remarked, it is illogical to compare the statistics of a single surgeon with the combined statistics of operators of unequal value.

It is to be feared that surgeons less experienced in this peculiarly special branch of surgery, and less skilful than Hirsch, will not have to record such good results, and must also recognise that hypophysectomy by the intra-nasal route is far from being an operation relatively harmless and exempt from difficulties.

However that may be, I asked myself if there was a real advantage in carrying out submucous resection of the septum, which is a long and troublesome operation, and always requires considerable experience in nasal surgery. Indeed—and upon this point I am in perfect agreement with Citelli and Levinger—I see no reason why Hirsch approaches the sphenoid between the two layers of the mucous membrane, since this submucous resection causes as much risk of falling in of the nose as total resection.

The reasons alleged by Hirsch seem to me to be founded on very frail foundations, and I consider that with the method of local anæsthesia by cocaine and adrenalin, hæmorrhage constitutes a factor which need hardly be taken into account.

The assumption that the danger of infection is reduced to a minimum in Hirsch's method is a pure hypothesis: for it is evident that in all procedures which follow the inter-nasal route, an aseptic region is placed in communication with a septic one. Nevertheless practice has shown that the fear of meningitis as a sequel to operation on the hypophysis is more hypothetical than real, since, out of fifteen operations followed by death, only three cases died from meningitis.

Analogous considerations have led West, as I stated above, to suggest cutting a long rectangular window in the septum; while Citelli is content to make a little opening near the extremity of the septum, through which he can penetrate into the sphenoidal sinns.

I have ascertained for myself the difficulty, even on the cadaver, of making the small window suggested by Citelli; it is certain that in the living subject considerable difficulties would be met with oftener than we think.

To approach the sphenoid by a very small opening made in the septum seems to me quite illogical and less advisable than the larger opening practised by West. The same conclusion follows even from reading the work of Citelli; for he insists, with great truth, on the dangers of opening the sella turcica without following the median line, but at the side. And although his experiments were made only on twenty-two bodies, it happened several times that he opened the sella laterally; generally on the side opposite to the nasal fossa through which he operated. For this serious reason I do not believe that Citelli's method, however simple and rational it seems to be, will be called to a great future. As a rhinological method that of West is preferable although open to somewhat similar strictures.

The intra-nasal method, which appeared to me the most logical, as well as the easiest to execute, and which keeps clear as far as is possible from most of the dangers, is one which consists in the preliminary resection of the greater part of the nasal septum. It may perhaps be objected that in making such a complete resection, the operator is deprived of a valuable guide, and that the bearings of the median line may become very difficult to find. On the contrary, by making the resection in the way I am about to explain, while leaving the inferior crest of the insertion of the vomer, the field of operation is notably enlarged, and the ultimate procedure in the locality of the sella turcica is rendered easier.

The procedure is as follows:

Intra-nasal Operation proposed by the Author.

(1) After cocaine anæsthesia and ischæmia by adrenalin, a small double-edged knife is passed into the left nostril, and the septum transfixed from one side to the other, between the columella and the anterior border of the quadrilateral cartilage. The transfixion begins close to the floor, and rises to the level of the insertion of the septum into the bridge of the nose.

(2) This incision allows the anterior edge of the quadrilateral cartilage to be made prominent by pushing the detached columella outwards towards the right nostril.

(3) While an assistant holds the columella aside, the septum is divided from before backwards, a few millimetres above the floor of the nasal fossæ. This can be done with cutting forceps, or even with a special narrow gouge with lateral guards, made on the model of Delie's gouge for the removal of septal spurs. It is sufficient to place the instrument against the anterior edge of the quadrilateral plate a few millimetres above the floor and press firmly upon the handle, in order thus to detach completely the septum below. If the bone offers some resistance, a few blows of the mallet will complete the division. In order to supervise the proper direction of the gouge, parallel to the hard palate, the mallet should be entrusted to an assistant.

(4) The quadrilateral cartilage is divided from front to back in a line parallel with the bridge of the nose, but leaving a strip some millimetres in width. The division of the bony septum is then continued either with bone-forceps or the chisel and mallet, following a line parallel to the cribriform plate of the ethmoid, and extending to the body of the sphenoid.

(5) The septum, thus detached above and below is grasped with strong toothed forceps and separated by movements of rotation. All that still remains of the end of the posterior border of the septum, including the crest of the sphenoid, and the superior angle of the vomer is then removed with cutting forceps.

(6) The resection of the septum having been thus carried out and all bleeding stopped, Killian's speculum is passed into the left nostril and opened widely so as to crush the middle turbinals, which are in the way on each side, and the lateral masses of the ethmoid. If necessary, parts which might be obstacles to the opening of the sphenoidal sinus should be resected.

(7) The opening of the sphenoidal sinus and the trephining of the sella turcica is easily carried out between the two blades of the

speculum, which the assistant holds exactly in the middle line. The inferior median crest, which the operator has taken care to leave, here serves as an excellent guide-line.

There are certain points in this operation upon which I should like to insist in conclusion. The intra-nasal route, as I have indicated it, is preferable to the others for the following reasons:

(1) The displacement outwards of the columnar cartilage allows an easy approach to the sphenoidal sinus, and free access to the median part of its anterior wall. It leads directly to the sphenoidal sinus, and does not, like the other routes, follow a more or less oblique line.

(2) It does not demand, like the method of Hirsch, a submucous resection, which is generally long and tedious. Resection of the nasal septum, without preserving the mucous layers, is a relatively simple procedure, within the capability of every rhinologist, and which can be performed in a very short time.

(3) By leaving the dorsal framework the nose will show no tendency to collapse. Resection of the septum, as I understand it, is an ideal operation from an æsthetic aspect.

(4) Although the two nasal passages are converted into one cavity more than double as wide, the operation has the great advantage over most procedures by the external route, that it leaves in place as far as possible the turbinals and the ethmoid system.

To surgeons who do not care to adopt the intra-nasal route, because they have not acquired the manual dexterity to render its performance easy, I recommend the plan of making a wide opening into the nose before resecting the septum.

The operation which I prefer in this case, both from the æsthetic point of view and because of the rapidity with which it can be carried out, is paramedian vertical rhinotomy, of which the following is the technique.

With strong straight scissors, one blade of which is introduced into the left nostril, the skin and subjacent cartilage are divided, as far as the nasal bone, and the incision is prolonged with a scalpel on the bone up to the root of the nose.

The flap is dissected off, freed from its bony attachments, and turned to the side; and, in order to enlarge the orifice of entry into the nasal fossa, parts of the nasal bone and of the ascending process of the superior maxilla are resected.

The resection of the cartilaginous septum, followed by crushing obstructing turbinals, is then carried out through the operation-wound with the greatest ease.

This method, which reduces the mutilation to a minimum, gives an exposure sufficient to render all the later stages on the sphenoidal sinus and the sella turcica convenient and easy. By this route the sphenoidal sinus is reached, not by following the roof of the nasal fossæ, as in the operations of Schloffer and others, but along a median plane, slightly oblique from below upwards. I think that this route is quite as good as that named by Giordano the transethmoidal route, which requires the complete resection of the ethmoid, and an evacuation of the contents of the nasal cavity—a mutilation very often useless.

Conclusions.

(1) Before operating on the hypophysis it is important to ascertain on a successful radiograph that the anatomical relations between the hypophysis and the sphenoidal sinus do not contraindicate the route which it is proposed to follow.

(2) The transpalatine, being the shortest and most direct route, deserves to take an important place in the surgery of the hypophysis.

(3) Operations by the nasal or intra-nasal route very often only allow an incomplete evacuation or curettage of the hypophyseal cell.

(4) The intra-nasal route is the most conservative, but is only capable of affording good results in the hands of rhinologists.

(5) In the methods of West and Citelli there is a risk of opening the sella turcica, not in the median line but on one side, which might be productive of disasters.

(6) The method of Hirsch, which includes submucous resection of the septum, is long and fatiguing, and demands unusual dexterity. Total resection of the nasal septum, with preservation of the dorsal arch, is superior to it from an æsthetic point of view, and also in the time taken in performing it.

(7) Resection of the septum may be preceded with advantage by a wide opening into the nasal fossæ. Vertical paramedian rhinotomy is the operation of choice.

A CRITICAL NOTE ON THE VALUE OF PITUITRINE PREPARATIONS IN REDUCING OPERATION OR POST-OPERATION HÆMORRHAGE.

BY JAMES DONELAN, M.Ch., M.B.,

Surgeon to the Throat Department of the Italian Hospital, London.

My attention was called at the beginning of this year to the probable value of the preparations of pituitrine in lessening bleeding in the course of operations on the throat and nose. Prof. Citelli's enthusiastic account of his experiences published in the *Bolletino*¹ for April decided me to make a trial.

This author, first of all, refers to the encouraging results that have followed the more general use of the extract of the posterior lobe of the pituitary body in physiological solution prepared and sold by various well-known firms. He speaks with an unexampled enthusiasm of its action in stimulating the contraction of the muscle-fibre cells of the vessels. He claims that no one before him has used pituitrine in hæmorrhage other than uterine. He has conducted a large number of experiments with the preparation of one firm, and on these he bases the present communication. In many cases of inferior turbinotomy he has injected $\frac{1}{2}$ to 1 cm. subcutaneously a few minutes before or after the operation, with the result "that plugging was rendered superfluous." Similarly, in cases of nasal polypi, in tonsillectomies, in sinus operations, in spontaneous epistaxis, hæmoptysis, and especially in malarial hæmophilia. "In all these cases the results have been more or less splendid," and he regards pituitrine as a most precious medicament for the physician as well as for the surgeon. He finds it valuable not only for its action on the muscular coats of the blood-vessels, but also for its tonic influence on the cardiac muscle. He injects usually subcutaneously in the arm, but a more prompt action can be secured by the intra-muscular or intra-venous method. Latterly he has given 1 cm. before operation and a second similar dose if required three or four hours after.

I am sorry that my own experience enables me to take only a somewhat qualified view of the hæmostatic powers of these preparations.

I have used them in twenty-five cases, including five intra-nasal operations, according to my method, on the maxillary antrum, in

¹ Citelli, Prof., Florence, "Pituitrine in Operative and Spontaneous hæmorrhage of the Respiratory Passages," *Boll. d. Mal. d. Orecch. d. Gola e. d. Naso*, Firenze, April, 1913.

one of which both antra were opened, twelve middle turbinectomies, six tonsillectomies, and two mastoids.

I found that the dose $\frac{1}{2}$ cm. was practically useless, and that, generally speaking, 1 cm. gave little better result as regards bleeding during operation. In more prolonged operations, like those on the mastoid antrum, the result appeared to be better in one of my cases. In the other it was difficult to form an opinion as the patient had had a partial operation many years previously, and a great number of small vessels had formed in the mass of fibrous tissue and these gave unusual trouble. I could not perceive any difference in the amount of bleeding following the turbinectomies, except that it was certainly greater than in cases where adrenalin was employed. In the operations on the maxillary antrum the bleeding during the operation seemed not to be influenced by the drug; on the other hand there seemed less oozing of blood afterwards.

Generally speaking, from this experience one does not feel inclined to set aside adrenalin or even hydrogen peroxide as a method of checking bleeding during operation in favour of these preparations. While they have the same disadvantage as adrenalin in retarding the onset of general anæsthesia, they do not appear so certain in their action either during or after operation. Their chief use would probably be to support the heart and obviate the effects of shock.

ROYAL SOCIETY OF MEDICINE — SECTIONS OF NEUROLOGY AND OPHTHALMOLOGY.

Combined Meeting, March 5 and 12, 1913.

DISCUSSION ON DISEASE OF THE PITUITARY BODY.

Cases of Disease of the Pituitary Body.¹

Notes of Three Cases. By H. L. EASON, M.S.

(1) Pituitary Tumour with Symptoms of Dystrophia Adiposo-genitalis, and (2) A Pituitary Tumour with Early Acromegaly. By GORDON HOLMES, M.D.

Two Cases of Bitemporal Hemianopsia, with other Evidence of Pituitary Tumour. By N. BISHOP HARMAN, F.R.C.S.

Pituitary Disease. By THEODORE THOMPSON, M.D.

Pituitary and (?) Adrenal Syndrome. By H. G. TURNER, M.D.

Precocious Development in a Boy, aged eight. By F. J. POYNTON, M.D.

¹ For details of these cases see *Proc. Roy. Soc. Med.*, April, 1913, vol. vi, No. 6.

Pituitary Tumour. By T. GRAINGER STEWART, M.D., and HERBERT PARSONS, F.R.C.S.

A Typical Case of Acromegaly, with Signs of Regression. By S. A. KINNIER WILSON, M.D.

Pituitary Tumour: Symptoms of Failure of Posterior Lobe Function. By T. GRAINGER STEWART, M.D., and ELMORE BREWERTON, F.R.C.S.

Pituitary Tumour (Lorain Type); Small Adult Body with Retarded Sexual Development, but no Adiposity; Failure of Function of Anterior Lobe. By T. GRAINGER STEWART, M.D., and R. RUTSON JAMES, F.R.C.S.

Case of Acromegaly. By W. H. WILLCOX, M.D.

Acromegaly: Pituitary Tumour showing the Failure of the Fields for Colour before the Failure of the White Field. By R. W. DOYNE, F.R.C.S.

The Structure and Functions of the Pituitary Body.—E. A. Schäfer, F.R.S.—*Summary and Conclusions:* (1) The pituitary body is developed partly from the ectoderm of the buccal cavity, partly from that of the neural canal. It is therefore partly epithelial and partly nervous in origin.

(2) The portion derived from the buccal epithelium consists of two portions, termed the *pars anterior seu glandularis* and the *pars intermedia*.

(3) The *pars anterior* is composed of large closely-packed epithelium cells, between which are very numerous and large blood-capillaries of a sinusoidal nature. Many of the cells are filled with eosinophile granules; some have basophile granules, others are clear or only slightly granular. It is probable, but not certain, that these are different phases of the same kind of cell.

(4) The *pars intermedia* contains fewer cells, with less distinct granules, and is less vascular. Many of the cells are converted into hyaline material which passes into the *pars nervosa*.

(5) The *pars nervosa* is mainly composed of neuroglia, but it also contains the hyaline material just mentioned and numerous interstitial granules. This material is traceable into the cerebrospinal fluid within the infundibulum of the third ventricle. Probably both the hyaline and granular material are derived from cells of the *pars intermedia*.

(6) There is usually a cleft in the middle of the gland along which the organ is easily separable into an anterior and a posterior lobe. The posterior lobe thus separated contains most of the *pars intermedia* and the whole of the *pars nervosa*.

(7) The anterior and posterior lobes appear to serve different functions, the anterior lobe being related to the general growth of the body, and especially of the skeleton, whilst the posterior lobe, which includes the *pars intermedia*, probably serves to promote the contractility and increase the tone of plain muscular tissue generally, as well as of the heart, and to excite the activity of certain glands—viz. the kidney and mammary gland.

(8) Some functions of the organ might be conceived to be carried out through the agency of nerves, but it is much more probable that the gland produces its action by means of chemical agents or hormones which pass either directly or indirectly into the blood, and through this fluid influence other and distant organs.

(9) In the case of the *pars anterior* no such hormone has hitherto been separated. But there is reason to believe that the influence of this part of the gland on growth is not produced through nerves; for in the

first place the pituitary receives but few nerve-fibres, and such as there are mainly go to the blood-vessels; and secondly, it is difficult to explain the effect of hyperplasia of the *pars anterior* in producing the hypertrophy of the skeleton which occurs in giants and acromegalics otherwise than by assuming that the enlarged gland is giving to the blood a greater amount than normal of a hormone which stimulates the growth of the skeleton, and probably of connective tissue generally. Such a hormone doubtless passes directly into the sinusoidal capillaries from the gland cells, which are sometimes arranged around the capillaries like the epithelium of an ordinary gland around its alveoli and ducts.

(10) In the case of the *pars intermedia* and *pars nervosa* (posterior lobe) a definite hormone can be obtained in solution. It is, however, doubtful if it has yet been fully isolated, although Houssay claims to have recently succeeded in obtaining it in a crystalline form. There seems no necessity to conclude with v. Cyon that the effects caused by intravenous injection of extracts of the posterior lobe are produced by stimulation of nerves within the gland.

(11) The hormone obtained from the posterior lobe, to which various names—such as pituitrin, infundibulin, hypophysin—have been given, resembles in some of its effects the hormone obtained from the medulla of the suprarenal capsules, but it is both chemically and physiologically a different body, appearing to act directly upon the protoplasm of cells, and not, as in the case of the suprarenal hormone, upon that portion of the cell with which the sympathetic fibres are connected.

(12) It is at present uncertain whether there is only one hormone present in the saline extract of the posterior lobe. It is, however, probable that the effects upon secretion are brought about by a different agent or agents from that which causes contraction of involuntary muscle.

(13) The hormone or hormones of the posterior lobe appear to be formed from certain cells of the *pars intermedia*, which undergo enlargement and degeneration into hyaline and granular bodies. These bodies push their way or are forced through the interstices of the neuroglial tissue of the *pars nervosa*, where many of them break down into a hyaline material and granules: they eventually pass bodily into the infundibulum of the third ventricle, where they are absorbed by the cerebrospinal fluid. It is probably in this way, and, therefore, by an indirect path, that the hormones of the posterior lobe get into the vascular system.

(14) Some relationship appears to exist between the thyroid gland and the pituitary body. This is indicated by the enlargement of the pituitary body and the formation within it of colloid-containing vesicles, as the result of removal or atrophy of the thyroid. If this relationship indicates a vicarious nature in the functions of these organs it is probably one which is limited to the production of the hormones which affect nutrition, especially that of the connective tissues, since these tissues are known to be influenced by changes both of the thyroid body and of the *pars anterior* of the pituitary body. But that other tissues may also be influenced is evidenced by the symptoms which are produced on removal or destruction of either gland, prominent amongst these being defects of the nervous system.

(15) There seems to be some sort of correlation between the pituitary body and the sexual organs, since in cases in which there is reason to think that deficiency of pituitary secretion exists, a condition of sexual infantilism becomes established, and the secondary sexual characters may remain undeveloped, or, in males, may exhibit a feminine type.

The Eye Changes.

Mr. J. Herbert Fisher said: As ophthalmologists, the phenomena of pituitary disease with which we are more deeply interested are naturally those dependent upon implication of the visual pathways. The ophthalmic appearances, if any, which we see are those of primary atrophy of the optic discs. In early stages disturbances of function may exist where no pallor is conspicuous, but the evidence of descending change may be expected to be not long delayed. When any intra-cranial mass exerts pressure directly upon the visual pathways, primary atrophy usually results; we should recollect, however, that slight evidences of papilloedema are sometimes present in association with enlargements of the hypophysis, and that even unilateral choked disc may be present in the late stages of pituitary tumours: the more extreme papillitis has usually been found associated with complete primary atrophy of the other optic nerve: the growth is raising the general intra-cranial pressure, while one optic disc is sheltered from the effects of such pressure by the direct involvement in the tumour mass of the intra-cranial portion of the optic nerve and of the optic foramen. In pituitary cases, as in all cases of degenerative change in the optic nerve, the wise ophthalmic surgeon hesitates to pronounce on the amount of vision which an eye with a pale optic disc may be expected to retain.

Much painstaking work has been done with the object of tracing in minute detail the various fibres and bundles of fibres of which the optic nerves are composed; most attention has naturally been devoted to the papillo-macular fibres, and the course of such of these as decussate in the optic commissure. I confess that, for the purpose of clinical diagnosis, we are not as yet able to put such knowledge to much practical use, and it would be of but little assistance to us to enter upon it here. With the broad facts of the crossing of the fibres from the nasal half of each retina, including a large decussation of the macular fibres, in the optic commissure everyone agrees. It is also generally admitted that in the optic tracts the fibres which have crossed in the commissure from the opposite side are found to occupy an inferior and peripheral situation, while the uncrossed fibres form a bundle centrally placed.

The ophthalmic surgeon works chiefly with his perimeter in recognising and observing pituitary disease. For want of perimetry in cases of optic atrophy I feel sure much interesting material is overlooked. The typical condition is one of bitemporal hemianopia, but the statement by no means covers the question. Nettleship¹ emphasised for us facts which Förster, Treitel and Doyne had previously pointed out—viz. that cases of central scotoma, at first glance simulating tobacco amblyopia, exist, in which extension of the scotoma eventually results in bitemporal hemianopia. Taking into consideration the large size of the macular bundle, Nettleship thought that disease involving the anterior angle of the commissure might explain these cases and their progress. Dean and Usher's experiments are probably the most conclusive as to the course of the macular fibres in the chiasma. My difficulty in regard to pituitary tumours is to conceive how they can press first at the anterior angle of the commissure—if they had eroded the anterior inferior wall of the sella turcica, invaded the sphenoidal air-cells and then extended through their roof, they might reach the required point. In Nettleship's cases there

¹ *Trans. Ophthal. Soc.*, 1897, xvii, pp. 277-99.

was no evidence of sinus disease; nowadays, we have the advantage of X rays to eliminate or prove bone erosion. He then narrated a case of pituitary tumour with an expanding central scotoma as the first symptom in the second eye, when the first was already blind. X rays showed destruction of the dorsum sellæ, but none of its anterior wall or floor.

On the other hand, he narrated another case in whom, with total blindness of one eye, the vision in the other was beginning to be affected in what he had previously suggested is the most usual way—viz. by a loss of temporal field which first reveals itself in the upper periphery.

This case may be quoted in some slight support of what Mr. Doyne has advanced—viz. that hemianopia of the colour-sense may precede that of the form-sense, and give us a guide for prognosis. Cushing agrees, and has reported cases, and I believe Mr. Treacher Collins could quote us a case in support. Perhaps, in favour of disturbance of the colour-sense as an early phenomenon, is the fact that patients often complain that they see everything as if through a "blue haze."

We have also to recollect that in a proportion of the cases of pituitary body enlargements, homonymous hemianopia is the symptom in the earlier development of the case; indeed, it is said to be about half as probable as a bitemporal hemianopia. I am quite certain that an evenly balanced loss of temporal field in each eye of simultaneous onset is the exception and not the rule. In many cases one eye is already blind, and we learn by the history that its vision went from the temporal side only when the patient first consults us for failure of the second eye; such failure is found to be developing, as an upper temporal loss of field, perhaps preceded by a more advanced hemiachromatopsia, or as a central scotoma expanding into the temporal field. Moreover, there are cases where one eye having reached total blindness, while the other preserves the nasal field, some change in the incidence of the lesion exactly reverses the visual result in the two eyes. Optic nerves are not in these cases always as atrophic as the pallor of their papillæ would suggest, and the successes as regards recovery of vision of cases where pituitary cysts have burst or been evacuated by operation must be borne in mind.

We have gone far enough to enable us to appreciate that the visual symptoms dependent upon enlargement of the hypophysis are variable, and that direct pressure on the optic chiasma, so glibly invoked, is far from being a satisfactory explanation of most of the cases. It is quite true that experimentally a sagittal section through the middle of the chiasma would cause immediately a symmetrical bitemporal hemianopia. Can we conceive of a tumour originating in the interpeduncular space producing by its pressure on the chiasma effects so definite and precise? It would require almost a knife edge to do it; the transverse measurement of the whole chiasma, including the non-decussating fibres at each lateral angle, is not more than $\frac{3}{8}$ in. It is even still more difficult, on this generally accepted basis, to explain the cases of bitemporal hemianopia which develop by an expanding central or paracentral scotoma. I have quoted a case this evening where one eye having become completely blind, its original failure starting by loss of, or in, its temporal field, failure is now advancing in the other eye by means of a scotoma expanding into its temporal field, after at least a year of interval. Simultaneous and anything like symmetrical development of bitemporal hemianopia is not common in the cases we are considering. Homonymous hemianopia may be the feature. In my experience loss of one temporal field, followed by loss of the nasal field in the same eye, and after an interval by loss of the temporal in the other eye, is as common a

sequence of events as the development of a bitemporal hemianopia; it seems likely that half-vision fields for the colour-sense may precede hemianopia of any character when caused by pituitary enlargement. Cases which indicate undoubted change in the incidence of the injurious pressure are on record, as well as those of unexpected recovery after spontaneous rupture or operative tapping of cystic swellings. The pituitary body is securely ensconced in the bony sella turcica, its stalk depending through the small aperture in the diaphragma sellæ of dura mater. When it enlarges, skiagrams prove that it expands most often by erosion of the posteriorly overhanging dorsum sellæ; the anterior boundary of the sella turcica is seldom disturbed. Tumours of the hypophysis may burst into the sphenoidal air-cells anteriorly and thence through their lateral walls into the orbits; the initial bony difficulty having been overcome the growth secures room for unimpeded extension in these directions. Laterally the cavernous sinuses bound the sella turcica, the bony walls being here deficient; the sinuses are very tough and offer firm resistance; the third, fourth, or first division of the fifth nerve in the outer wall may be, though they are but rarely, implicated by pituitary tumours; the sixth nerve in the floor of the sinus groove under the carotid artery still more rarely is pressed upon. Anosmia is not uncommon—in *post-mortem* examinations, the olfactory lobes, or their roots forming the antero-lateral boundaries of the anterior perforated spots, are often found to be involved, but this is in the last stages of the disease. I should be glad to know whether neurologists think the anosmia present in a proportion of pituitary cases could be attributed to involvement of the uncinate gyrus. Epileptiform attacks ushered in by an olfactory or gustatory aura are not uncommon.

Personally, my cogitations are leading me to the conclusion that the visual phenomena in many of the cases are explained by traction effects on the visual pathways as the tumour extends upwards behind the chiasma and between the optic tracts in the interpeduncular space. A tumour fairly symmetrical in outline would stretch the decussating fibres in the chiasma, while in no way dragging on the direct fibres, and gives us a bitemporal hemianopia; it is conceivable that the highly specialised function of the macular fibres might be more readily injured than that of the other fibres in the chiasma; on a traction hypothesis the expanding scotoma cases are to be understood, and hemiachromatopsia can be recognised as a symptom which it would be very difficult to accept on a direct pressure hypothesis. If the tumour mass, having already caused a bitemporal hemianopia, increased now more to the right than to the left side, it would probably drag on the left optic nerve as a whole, or accentuate the angle between the left optic nerve and the left optic tract; in either way the fibres from the temporal half of the left retina would now suffer by dragging, and the eye would be rendered blind; the tumour expanding to the right would diminish the acuteness of the angle or curve formed by the right optic nerve and the right tract, and the uncrossing fibres from the right retina might long preserve their function.

A pituitary tumour growing in the interpeduncular space asymmetrically and from the first lying more to the right than to the left of the median line might, I think, be expected to injure by traction first the decussating fibres from the left optic nerve and then its non-decussating fibres before any fibres of the right optic nerve become unduly stretched; as the crossing fibres from the right retina became involved, loss of temporal field on this side would be expected to occur, either centrifugally or centripetally. The possibility that a displaced optic nerve may receive

injurious pressure from the bony optic foramen on that side towards which it is displaced can also be conceived. In the rarer cases of homonymous hemianopia direct pressure on the optic tract concerned is, no doubt, the true explanation: in the tract the uncrossed fibres seem to be afforded the more sheltered situation.

I think the idea of traction, rather than of direct pressure, fits in better with the clinical facts and the anatomical possibilities. I am inclined to think also that it is more compatible with the recovery of physiological function, which in a few fortunate instances has occurred.

The question is one which may be of interest not only from an academic, but from a very practical point of view. Although up to now operative treatment of pituitary tumours has been in the direction of reaching the sella turcica, either for decompression or in the rather futile hopes of meeting with a cyst or removing a growth, by the trans-nasal route, it seems likely that a safer and more surgical method may be devised through a fronto-temporal opening of the cranium. In the hands of a cerebral surgeon who recognises his own limitations and those of his patient, this route seems the more hopeful. The decision of the points I have raised may be of the first importance in enabling the surgeon to decide from which side to attack the growth.

One more question: If this is to be the method, would a free removal of the bone and opening of the dura mater on the opposite side at the same time allow any more freedom for elevation and displacement of the brain, and thus give more ready access to the pituitary region? For experimental purposes on dogs Paulesco found this bilateral opening of much assistance. The point could be readily settled by a surgeon on the cadaver.

[A bilateral procedure has, as a matter of fact, been employed several times by Cushing in his "bitemporal method" and a bifrontal operation has been performed by McArthur, but perhaps Mr. Fisher has in view elevation of the anterior half of the skull-cap elevating both frontals and both squamosals.—ED.]

The Operative Treatment.

Dr. William Hill dealt with the question of operative treatment. Surgical decompression and even partial removal had now been carried out on the continent and in America in such a considerable number of cases with so much substantial relief that there was every likelihood that a good deal of operative activity would centre around pituitary tumours in this country in the immediate future. He was not qualified to discuss the indications for operation or for deciding when the craniotomic and when the naso-sphenoidal route was to be preferred; but as a nasal surgeon who had recently opened the floor of the pituitary fossa by the simplest nasal method, he felt qualified to criticise from a rhinologist's point of view the formidable technique employed abroad by general surgeons who had embarked on these operations. For the moment surgeons here were likely to be dominated by the teachings of Cushing on account of the brilliant operative experiences and results recorded in his recently published and remarkable monograph.¹ From the point of view of the rhinologist, however, Cushing's favoured method of operating

¹ See p. 382 of the present issue of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

was unnecessarily sanguinary and severe, and technically inferior in many respects to the more artistic procedure of Hirsch, a Vienna rhinologist. Cushing had played a meritorious part in showing that the mutilating, extensive and dangerous exenterations of the Schloffer type of operation were no longer necessary, and that excellent access could be obtained to the sphenoidal sinuses by a much less formidable method—viz. by adopting Halstead's modification of Rouge's infra-labial operation. But displacement of the external nose, even by a mitigated operation, is not the route which would naturally suggest itself to a rhinologist in order to exenterate the two sphenoidal sinuses, which is after all only one step removed from resecting the floor of the sella turcica. Submucous resections of considerable portions of the cartilaginous and bony nasal septum are of almost daily occurrence in a rhinologist's practice, and these operations are invariably done *per vias naturales*—through one or other nostril. It is true the amount of septum resected is not usually so extensive as required in approaching the sellar floor, but it is a quite simple and almost bloodless operation to make a large submucous tunnel to the rostrum of the sphenoid, and is often done under local anæsthesia. Rhinologists, not perhaps frequently, but at all events occasionally, open the sphenoidal cavities, and this can always be done through the nasal passages with certainty and precision under the guidance of the eye; and to follow up a large submucous septal resection with exenteration of both sphenoidal sinuses, and removal of their septum, is not an operation which a nasal expert would regard as likely to put special strain on his surgical resource and skill. Should the patient's anterior narial opening be small, and it is desired to have a wider proximal end to the long mucomembranous tunnel leading to the sellar floor, it is quite easy to slit up one nostril forwards and upwards as carried out in a recent case by Mr. Graham. The patient that he (Dr. Hill) had operated on at St. Mary's Hospital (at the request of Dr. Leonard Williams, who transferred her to him from the French Hospital) was a pronounced acromegalic with polyglandular lesions, and as the nostril was about twice as large as normal, he had not employed Mr. Graham's modification, but carried out the pure Killian-Hirsch operation. Mr. Graham's auxiliary incisions, either through the nostril as just mentioned, or of fissuring the tip of the nose and columella, as the deviser himself preferred, were, in his (the speaker's) opinion, valuable modifications in the technique of the Killian-Hirsch operation. Of course, our difficulties were not at an end when the sphenoidal sinuses were fully exenterated; to proceed to the removal of the sellar floor had been spoken of as a mere extra step, but, admittedly, if one did not keep a good line, it might be a dangerous step, and it sometimes terminated in a leap in the dark. There should be no danger of wounding the cavernous sinuses and the carotid arteries if one were careful to chisel in the middle line. It is an even more serious matter to perforate too high up, as not only the circular sinus and carotid arteries might be wounded, but injury to the optic chiasma would increase the visual defects which the operation had been primarily undertaken to relieve. Of course, there were some unavoidable risks. We might be unlucky enough, as in the case he (Dr. Hill) had operated on, to encounter a large vascular, malignant tumour which had invaded the dura mater and the veins connecting the two cavernous sinuses. In several recorded cases where death occurred from either primary or secondary hæmorrhage an identical condition of affairs was found. We cannot always expect to find cysts or slow-growing adenomas, which are, of course, the most favourable lesions to deal with. Dr. Harris's patient

was much relieved for a few weeks by a decompression operation performed by Mr. Graham, by a modification of the Killian-Hirsch method, but did not survive more than three days after removal of a considerable piece of the tumour two months later. In this case also the *post-mortem* examination disclosed a large malignant tumour extending up to and involving the floor of the third ventricle, the major part of the tumour, as in the speaker's case, being above the floor of the diaphragma sellæ.

He had recently looked up the operation mortality in the first hundred records he had happened to come across of cases of surgical interference by the nasal route. This number, recorded by twenty-nine different operators, by no means included all the records of the published operative results to date, but was sufficiently large and instructive for the purpose in view. The total operation mortality in these hundred cases was twenty-four. Of forty patients operated on by the superior nasal route—*i. e.* either by Schloffer's original rhinotomic method or by mitigated modifications of the same—fifteen had died as the immediate result of surgical interference, an operation mortality of about 37 per cent. Of thirty-one patients operated on by the lower nasal route—the Rouge-Halstead method—four only had died, a mortality of about 13 per cent.; whilst of twenty-nine cases operated on by the endo-nasal method of Hirsch four also had died, which worked out at between 13 per cent. and 14 per cent. If we took the immediate operative results of the two surgeons who had done the largest number of these operations, we found that Cushing had four deaths out of twenty-six cases operated on by the Rouge-Halstead method, and Hirsch had three deaths out of twenty-six cases operated on endo-nasally by the Killian-Hirsch method—the deaths in these two latter lists being due rather to the unsuitability of the cases for operative interference as found at the *post-mortem* examination than to errors in operative technique.

He would not go into statistics of temporary or of prolonged improvement brought about by per-nasal operations, but a perusal of the monograph of Cushing and of the long paper by Hirsch in Fränkel's *Archiv. für Laryngologie*¹ would show that very substantial amelioration of some symptoms was obtained by operation in a considerable number of these unfortunate patients.

He, in common probably with most present, cherished no illusion that pituitary surgery by the nasal or any other route was likely to prove a very specially inviting field for operative aggressiveness. Anyone who thought otherwise would do well to study carefully the convincing paper by their President of that evening (Dr. Tooth)² on 500 cases of brain tumour in which the disastrous results, in most cases, of any operative measures beyond mere decompression were clearly brought out. Rhinologists here had not appeared keen to embark on this recent extension of nasal surgery, but there would, he thought, be no difficulty in inducing some of them to do their best to oblige their neurological *confrères*, provided the latter could make a suitable case selection.

Dr. HILL demonstrated, by the aid of large, coloured wall diagrams, the most extensively used nasal routes of approach to the pituitary fossa, and exhibited the following tabular scheme, which includes nearly all the operations practised or suggested.

A star (*) indicates the methods which will appeal to general surgeons, and a double star (**) those likely to be favoured by rhinologists.

¹ See p. 378 of this issue of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

² *Proc. Roy. Soc. Med. (Neurol. Sect.)*, pp. 1-48.

CENTRAL NASAL—i. e. SEPTAL ROUTES.

A. *Endo-nasal Method.*

** (1) The Killian-Hirsch method: Commencing with Killian's resection of the septum, followed by resection of the anterior walls and septum of the sphenoidal sinuses + removal of the floor of the sella turcica originated and carried out many times (Hirsch, and later by Hill once).

B. *External Rhinotomic Methods.*

** (2) Enlargement of one anterior narial opening by an anterior incision forwards and upwards, followed by the Killian-Hirsch operation (Graham).

** (3) Vertical fissure of the tip of nose and columella, followed by the Killian-Hirsch operation (Graham). (Transverse fissure of columella alone suggested by Kanavel.)

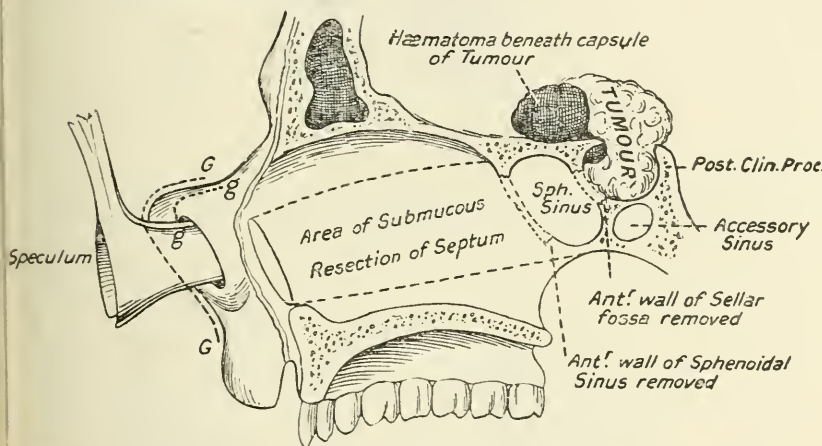


FIG. 1.—Diagram by Dr. Hill of the endonasal decompression operation. (Killian-Hirsch method) performed by him on Dr. Leonard Williams's patient. *Post mortem* a post-operative hæmatoma was found and also an accessory air sinus in the basi-sphenoid. The Killian speculum should have blades 9 cm. long in order to reach the sphenoidal sinuses. The alternative auxiliary incisions used by Mr. Graham are indicated by dotted lines at *G G* and *g g*; the latter, in cases of narrow noses, can be extended upwards slightly to the left of the mid-line as far as the root of the nose, the nasal bone divided, and half the external nose turned to the left as an osteoplastic flap (Linhart's rhinotomy).

(4) Lariche's external transverse naso-labial incision with upward displacement of the cartilaginous external nose, followed by septal resection, etc. (Kanavel, Mixter).

* (5) Sublabial oral incision (a miniature Rouge operation) with upward displacement of the cartilaginous external nose, followed by submucous resection of septum, etc. (suggested by Löwe, but first carried out by Halstead and later adopted by Cushing).

(6) Vertical central fissure of the whole of the external nose with temporary separation of osteoplastic flaps, followed by submucous septal resection, etc. (suggested by Löwe).

(7) Kocher limits the fissure to the *bony* external nose.

* (8) Bruns' lateral osteoplastic displacement of the external nose to the right, followed by septal resection, etc. (Eiselsberg, Stunne, Thorburn, etc.).

* (9) Ollier's inverted U-shaped incision with downward vertical osteoplastic displacement of the external nose, followed by septal resection, etc. (Hochenegg, Kocher, etc.).

(10) Allandale's operation, which includes Rouge's sublabial elevation of nose + separation of the maxillæ, osseous palate, etc. (Koenig, Löwe).

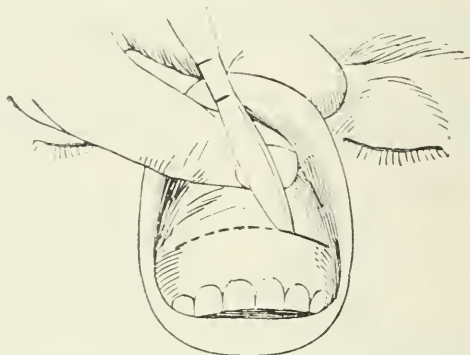


FIG. 2.—Initial sublabial incision in the Rouge-Halstead operation. (After Halstead.)

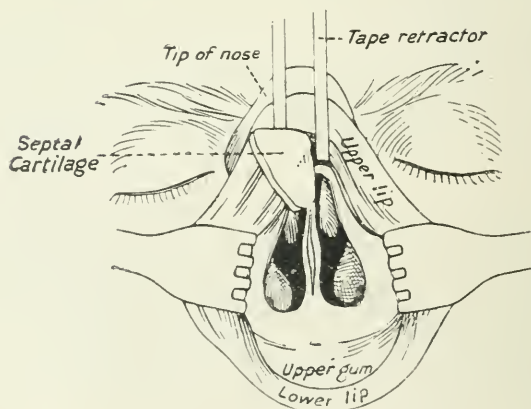


FIG. 3.—Rouge's upward displacement of the nose preparatory to submucous septal resection, etc. (After Halstead, slightly altered.)

(11) Bucco-palato-septal route—partial resection of the hard palate and of posterior part of septum, etc., through the mouth (suggested by Koenig and Löwe, but first employed by Ballance).

In all of these septal routes one or both middle turbinals, and even the inferior turbinals, can be removed either at the time of operation or a few days beforehand. The lateral compression of the lateral ethmoidal regions by means of a nasal dilator through the muco-membranous septal tunnel, as carried out by Kocher, and by Cushing, is, however, a that is really necessary.

LATERAL NASAL *i. e.* ETHMOIDAL ROUTES.A. *Endonasal Method.*

(12) Hajek's unilateral ethmoidal exenteration, followed by resection of postero-superior region of vomer + removal of the anterior walls and septum of sphenoidal sinuses, etc. (Hirsch, West).

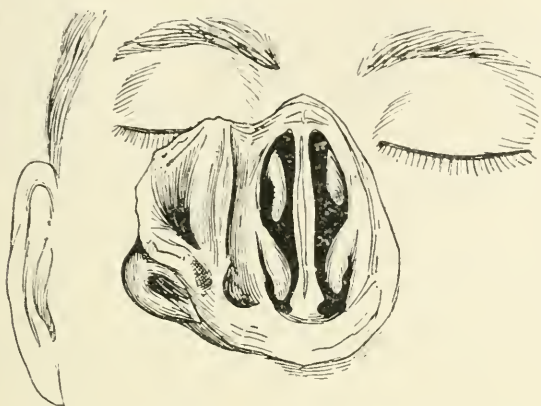


FIG. 4.—Bruns' lateral osteoplastic displacement of the external nose; the first stage in V. Eiselsberg's septal route operation (8). This probably affords the *shortest* septal route to the sellar floor. (After Bosworth.)

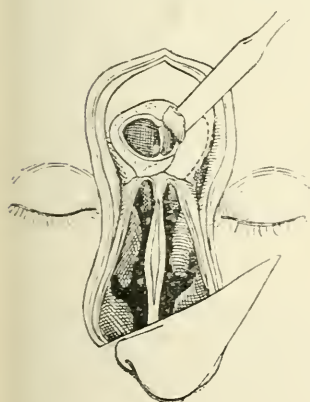


FIG. 5.

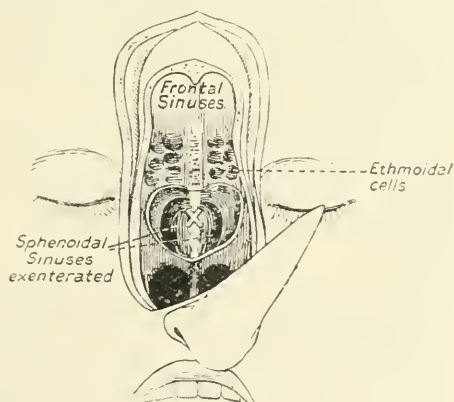


FIG. 6.

FIGS. 5 and 6.—Proust's semi-diagrammatic illustrations (slightly modified) of two stages of Schloffer's operation. The cross (X) in Fig. 6 shows the centre of the sellar floor, the removal of which is the next stage.

B. *External Rhinotomic Methods.*

(13) Chiari's operation carried out by an incision (allied to Langenbeck's and Moure's) between the side of the bony nose and orbit, with removal of the nasal process of the maxilla, followed by ethmoidal exenteration, etc., as in Hirsch's ethmoidal method (12) described above (Chiari).

(14) Moure's external rhinotomy, followed by ethmoidal and sphenoidal exenteration, etc., as above.

(15) Watson-Williams's osteoplastic fronto-ethmoidal operation + sphenoidal exenteration, etc. (Suggested.)

These mainly ethmoidal routes are probably destined to become obsolete.

EXTERNAL RHINOTOMIES WITH COMBINED SEPTAL AND ETHMOIDAL RESECTIONS.

(16) Schloffer's operation commenced with downward displacement of the external nose by Ollier's incision with a frontal prolongation; the upper part of the septum was removed, and free exenteration of the frontal, ethmoidal and sphenoidal sinuses on each side carried out, even the os planum being removed. Hochenegg used Bruns' incision, and made a temporary osteoplastic flap to expose the frontal sinus. Eiselsberg and others adopted this latter method for a time.

(17) Djalil resected the same areas as Schloffer, but used a Y-shaped incision, exposing the frontal sinuses and fissuring the whole of the external nose in the mid-line vertically.

(18) Kocher formerly fissured only the bony part of the external nose, using a central vertical incision and a transverse one at each end, and gaining access by turning aside the lateral osteoplastic flaps; the subsequent exenterations, however, were nearly as extensive as those of Schloffer and Djalil.

(19) The above unnecessarily extensive and severe procedures gradually gave place to a *mitigated* Schloffer type of operation in which the external nose was displaced either by Ollier's or by Bruns' method, and partial ethmoidal exenteration was carried out on one side only (the frontal sinuses not being touched), the upper part of the septum was resected and the sphenoidal sinuses opened up and their septum removed, etc.

It is becoming more and more obvious that there is no necessity to add to the difficulty and danger by opening the ethmoidal cells at all, as removal of one or both of the middle turbinals, or even compression alone of the lateral ethmoidal regions, gives sufficient room if one of the submucous septal routes is employed. (See Septal Route operations above.)

OTHER ROUTES.

(20) Suprahyoid lateral pharyngotomy and opening up the floor of the sphenoidal sinuses by way of the nasopharynx. (Suggested by Löwe.)

* (21) Lateral subtemporal craniotomy (unilateral method first carried out by Paul on Horsley's suggestion; also employed by Horsley, Cushing, Dalgren, etc. Bilateral method now employed by Cushing, etc.).

* (22) Anterior frontal craniotomy (unilateral method suggested by Krause and carried out by McArthur, etc. Bilateral method suggested by Kiliani and carried out by McArthur, etc.).

The craniotomic operations of Horsley and Krause have been usefully employed in some instances for decompression and for partial removal of large tumours. Cushing has operated by the bi-temporal route in some cases where a previous operation by the naso-sphenoidal route had proved insufficient on account of the size of the tumour, which had extended far beyond the limits of the pituitary diaphragm and involved the infundibulum and floor of the third ventricle, etc.

Mr. GRAHAM said all he had to remark was that, having escaped the

dangers which Dr. Hill enumerated, it was quite possible to eviscerate the pituitary fossa. But if the growth had got beyond the fossa operation was not of any great use beyond decompression. If it were possible to make the confident diagnosis of growths restricted to the fossa, there was no reason why they should not be removed completely, particularly in the case of adenomata and cysts.

Dr. GRAINGER STEWART showed a specimen of pituitary tumour from a patient whose first symptoms commenced in 1903 with pain in the upper division of the left fifth nerve, followed by a gradual onset of paralysis of the left third nerve. The pain was paroxysmal, and it was thought it might be due to syphilitic meningitis or tumour. He was radiographed, but nothing abnormal was seen. He was treated with anti-syphilitic remedies, but without any benefit. He was next seen twelve months afterwards. At that time he was completely blind in the left eye, and had temporal hemianopsia in the right. In December, 1904, the patient, who was under the care of Sir William Gowers, was operated on by Sir Victor Horsley, who removed the bone on the left side of the head in the frontal region, and exposed the tumour by lifting up the left frontal lobe. The left side was chosen because the cranial nerve symptoms were left-sided, and the presumption was that the tumour would extend more to the left side than to the right. The tumour was visible at the operation, and Sir Victor Horsley scraped some of it away with a spoon. The patient recovered perfectly naturally from the operation, but the whole tumour was not removed. Unfortunately there was practically no alleviation of the symptoms. As the pain along the distribution of the fifth nerve continued, another operation was done six months later, in 1905. Sir Victor Horsley this time removed the left Gasserian ganglion. The pain then stopped and the patient remained practically in the same condition as before the operation, with the exception of being free from pain. About three months after the operation he suddenly became hemiplegic on the right side with aphasia. For seven years he remained alive, and though he completely lost his vision, he recovered his speech after he had been aphasic for two years. It was not until the last three or four years that he began to develop glandular symptoms; he became very adipose, his complexion became pale and waxy, his sexual organs regressed, and his hair began to come out. This case resembled the one which was shown at the last meeting—a man, aged fifty-one, who for many years had had adiposity and sexual regression typical of deficient action of the posterior lobe of the pituitary gland. He wished to mention the case, shown last week, which Mr. Rutson James had sent to him, and which corresponded to the Lorain type. The patient, a girl, aged twenty, who looked like a child of fourteen, had an infantile uterus, but some pubic and axillary hair. Her symptoms—headache, vomiting, etc.—were of a year's duration. At first they recurred every month, so that her mother thought they were connected with menstruation. Later she developed fits and signs of general intracranial pressure, with failure of vision. She was an example of affection of the pituitary body, in which there was true infantilism; her sexual organs were infantile, but there was no adiposity or increase of sugar tolerance. She gave a very well-marked thermic reaction on injecting extract of anterior lobe of the pituitary. Therefore he suggested she was an example of hypopituitarism, affecting chiefly the anterior lobe. If the thermic test was of value, she was suffering from deficiency of that lobe.

With regard to the treatment of pituitary cases in general there was no doubt that the majority of these patients would live for years

without operation, and the only object of operative interference seemed to be to save the sight. If that could be satisfactorily carried out by nasal operation, he believed that much of the difficulty which at present confronted the profession would be removed. It was now possible to diagnose these cases very much earlier than when one had to rely upon the development of ophthalmic symptoms. That being so, he did not see why in a short time it should not be possible to treat the glandular manifestations of such cases by extracts of either the anterior or the posterior lobe of the pituitary body, according to the results of the different tests which were applicable to such cases, and by timely operation by the nasal route to retard or prevent the loss of vision. Careful examination should permit of appropriate post-operative glandular treatment to compensate for the disturbance or destruction of the gland consequent upon operation.

Radiography of the Pituitary.

Dr. Theodore Thompson said he wished to draw attention to certain radiographic appearances in cases of pituitary enlargement. The radiograms were all taken by Dr. Gilbert Scott, Radiographer to the London Hospital. The taking of these radiograms requires great care, and a special apparatus has been devised by Dr. Scott to ensure the accurate apposition of the orbital plates and a clear view of the sella turcica. In the normal sella turcica the appearances are fairly constant. The cavity is roughly circular in outline in the radiogram. The diameter of the circle is about 1.2 cm. and the posterior clinoid process is separated from the anterior clinoid process by about 1 cm. The posterior clinoid process may be sharply pointed, or have a blunted or bulbous end. The base of the fossa is formed by dense bone, which throws a strong shadow. In pituitary enlargement the appearances differ considerably in various cases. He showed two cases of pituitary tumour; in the one there is bitemporal hemianopia but no sign of acromegaly or infantilism; in the other there is typical acromegaly without any limitation in the fields of vision. In the case of bitemporal hemianopia the pituitary fossa is shallow and greatly enlarged, and the striking feature is the separation of the anterior and posterior clinoid processes, which now are separated to a distance of 2.3 cm. In this case the growth has evidently enlarged upwards and involved the optic chiasma. In the case of acromegaly without ocular symptoms the appearances are very different. There is marked enlargement of the sella turcica in a downward direction, and the dense bone, which in normal cases forms the floor of the cavity, is eroded. The cavity is now about 3 cm. in diameter, the enlargement having taken place chiefly in a downward and forward direction. The clinoid processes are not, however, widely separated, being only distant 1.5 cm. instead of the normal 1 cm. In this case there is clearly an enlargement of the anterior lobe of the pituitary gland, which has not spread upward to any extent and has not involved the optic chiasma. This relation between the radiographic appearances and the clinical symptoms of pituitary disease is important, but the relationship will not be a constant one, for an enlargement of the anterior lobe may spread upwards and involve the optic chiasma, and thus give the combined picture of acromegaly with ocular symptoms. It would, however, be interesting by examination of a large number of cases to determine whether any correlation exists between the degree of involvement of the ocular symptoms and the separation of the clinoid processes.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

January 10, 1913.

MR. HERBERT TILLEY, *President of the Section, in the Chair.*

Cyst of the Pituitary Fossa; Operation by the Nasal Route.—

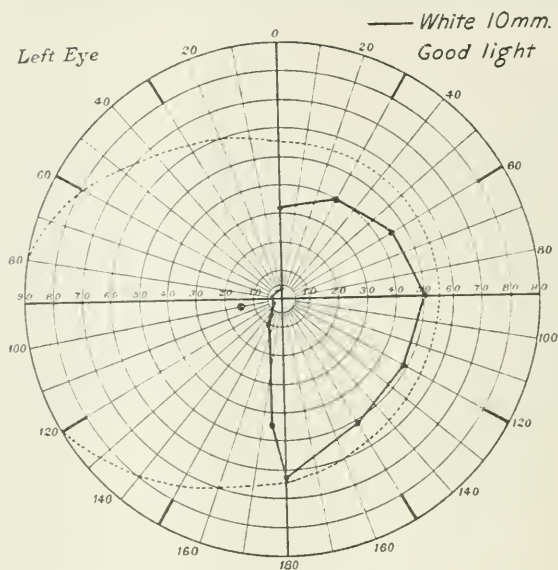
C. I. Graham, F.R.C.S.—Female, aged thirty-seven; admitted to St. Mary's Hospital under Dr. Wilfred Harris on November 8, 1912, for failing sight for eighteen months, temporal headaches, drowsiness, slow mental reaction, and incontinence of urine for several months.

On admission: Articulation good; slow reaction time; drowsy; right temporal headache. Right eye—blind, optic atrophy, pupil shows only consensual light reflex. Left eye—vision present in nasal field, pupil dilated and shows neither direct nor consensual light reflex. Urine normal, 16 to 24 oz. daily; no trace of sugar in urine for twenty-four hours after administration of $7\frac{1}{2}$ oz. glucose. Skiagram shows pituitary fossa flattened out and enlarged. Temperature 98.4°F ., pulse 82, respiration 20.

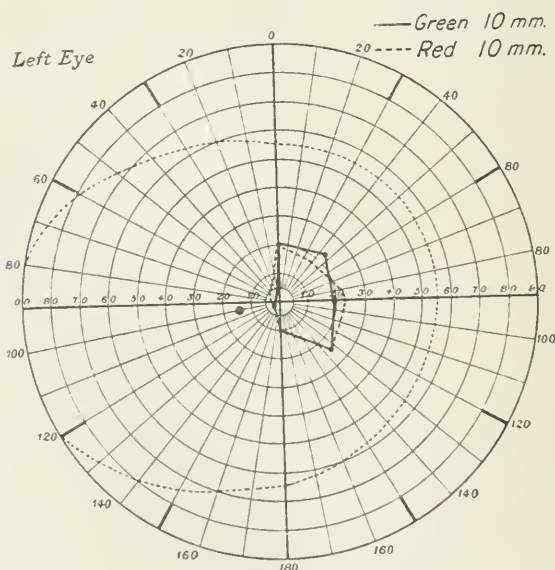
By November 26 the drowsiness had increased almost to coma; incontinence of urine and fæces; eyesight worse; respirations had slowed to nine or ten per minute. Urôtropine (90 gr.) was given by the mouth.

Operation (November 27, 1912): Half an hour before operation morphine ($\frac{1}{4}$ gr.) and atropine ($\frac{1}{150}$ gr.) were injected subcutaneously. A quarter of an hour before operation both nasal fossæ were packed with gauze strips soaked in 1 in 1000 adrenalin containing 5 per cent. cocaine. Anæsthesia was induced by the intravenous injection of ether solution. The nasal vestibules, the upper lip, and neighbouring skin of the face were painted with tincture of iodine (B.P.) and a sterilised cloth was laid across the lower part of the face, a hole being cut in the cloth to admit of access of the nose. Illumination was obtained by means of a Nernst light reflected from a frontal mirror. One assistant was employed to keep the field of operation free from blood. The incision, which was made through the skin, commenced at the tip of the nose and was carried to the upper lip, dividing in its course the columella and about $\frac{1}{8}$ in. of the philtrum, keeping accurately in the middle line. The free edge of the septal cartilage was defined and the skin of the vestibule raised from each side of the septum. It was at this stage that the oozing of blood from minute points caused considerable delay in raising the vestibular skin, but the difficulty was overcome by assiduous mopping; and from this stage to the completion of the operation the hæmorrhage was insufficient to cause inconvenience, regular mopping being all that was necessary. The mucous membrane was easily raised from the sides of the septum and the elevation was carried back to within 1 in. of the posterior edge. A speculum with narrow, 3 in. blades held the mucous flaps aside during the removal of that part of the septum which corresponded in antero-posterior depth with the raised mucous flaps, and in vertical depth with the skin incision, the tip of the nose being firmly upturned by the hand holding the speculum. The mucous membrane over the posterior edge and upper part of the vomer was raised by means of a dental "stopper" which terminates in a single corkscrew turn: the excursion of the instru-

ment along the posterior edge of the vomer was controlled by the index-finger of the left hand in the post-nasal space. Killian's long



A. S. December 17, 1912.



A. S. December 17, 1912.

nasal speculum with flat blades, $\frac{1}{2}$ in. by $4\frac{1}{2}$ in., was then substituted for the smaller instrument, and the vomer was twisted from its attachment to the sphenoid by means of Luc's ethmoidal forceps. As it was found that the middle turbinals encroached upon the mucous membrane

tunnel, they were forcibly separated by means of a metal glove-stretcher, with screw attachment on the handles, the blades being inserted into the tunnel. The mucous membrane was then elevated from the anterior surface of the sphenoid so that the ostia of the sinuses were clearly brought into view. The anterior wall and intersinus septum of the sphenoid were removed by means of small blunt hooks and Luc's ethmoidal forceps. The sinuses were symmetrical, and there was no bulging to indicate the position of the pituitary fossa. The position of the pituitary fossa was found by taking a line which commences at the junction of the alæ nasi and upper lip, and runs upwards and backwards towards the junction of the pinna with the side of the head, and this line will be found to pass immediately beneath the lower and outer margin of the orbit. A line commencing at the same spot and traversing the lowest part of the cavity of the orbit will be found to encroach upon the optic chiasma. The opening into the pituitary fossa was made by placing a long chisel parallel to the correct line, with the cutting edge against the roof of the sphenoidal sinus, and then cracking the bone by a few gentle taps of a hammer, a mastoid burr with a small head completing the stage. Immediately the bone was removed there was a rush of from 1 to 2 dr. of blood-stained fluid, and when the fluid was removed dura mater was found to be lying against the opening. After enlarging the opening in the bone the dura mater was incised, and as this gave rise to brisk hæmorrhage on the two repeated attempts at exploration, the operation was concluded by swabbing out the area of operation with mops soaked in 1 in 4000 aqueous solution of mercury binioidide, and then inserting a suture near each extremity of the skin incision, and sealing the wound by collodion and cotton-wool.

Before consciousness returned respirations were 24, temperature 97° F., pulse 100. During the first twenty-four hours after the operation there was great thirst, frequency of micturition, and polyuria (100 oz.). She was excited and garrulous.

The local after-treatment consisted of instillation of hydrogen peroxide into the nasal fossæ, followed by gentle irrigation with normal saline. Sixty grains of urotropine were given by the mouth upon the third and fourth days after operation respectively, then from the fifth day to the seventeenth inclusive 45 gr. were given daily.

December 12 (fifteen days since operation): No incontinence since operation; the patient is practically normal with the exception of the sight, which she thinks has improved slightly. She has been getting up daily since December 10.

The patient left the hospital on December 17, 1912, twenty days after the operation.

Dr. DAN MCKENZIE said that, so far as he knew, this was the first case of the kind which had been operated upon in Britain, and Mr. Graham was to be congratulated upon his success. A fair number of cases had been dealt with successfully abroad. He thought the object of selecting the route for submucous resection was to minimise the chances of infection, and that probably contributed to the success. With regard to the non-recovery of sight, he supposed that to be due to the fact that the damage to the eye had lasted too long.

Meeting on March 7, 1913.

Specimen of Cerebral Tumour which involved Pituitary Fossa; Microscopical Section.—C. I. Graham, F.R.C.S.—The case was

shown at the meeting of the Section on January 10, 1913,¹ after operation on November 27, 1912. A second operation was performed on January 29, 1913, because of recurrence of marked drowsiness and headaches.

Because some difficulty in separating the muco-perichondrial flaps made by the previous operation was anticipated, it was decided to approach the pituitary fossa by way of the left nasal fossa proper; therefore the ventricle of the left vestibule was laid open by an incision $\frac{1}{2}$ in. in length, which began at the opening of the naris and terminated at the tip of the nose. Next, the left middle turbinal was reduced in size, and after a few drops of blood were removed on wool pledgets, a vertical incision was made in the mucous membrane which had previously covered the front wall of the sphenoidal sinus. When the mucous membrane was separated laterally, some difficulty was experienced in distinguishing the dura from the adjacent bone; after defining the opening into the fossa by means of a probe, more bone was removed by means of a $\frac{5}{8}$ -in. burr. Then the dura was removed by Luc's forceps and the fossa explored. A piece of growth was removed the size of half a walnut, which appeared to be of a papillomatous nature. The patient bore the operation very well and next day was well enough to be moved to another ward in the hospital, but the same night, thirty hours after operation, suddenly collapsed.

Post-mortem.—Cerebral convolutions flattened. An encapsulated growth the size of a small golf-ball was found in the position of the infundibulum in the floor of the third ventricle, distorting the optic tracts and raising the basal ganglia. There was a breach in the capsule of the growth, where it lay over the pituitary fossa: the fossa contained a markedly compressed pituitary section, but no growth was found in the fossa. The entire floor of the fossa, which was very large, had been removed, the boundaries of the opening being the cavernous sinuses laterally, the olivary eminence anteriorly, and the dorsum sellæ posteriorly. There was no effusion of blood, nor was there any evidence of sepsis.

Provisional diagnosis of perithelioma by microscopic examination (Dr. Spilsbury).

Brain, with large Pituitary Tumour, from Patient who died from Hæmorrhage after Partial Removal of Floor of Sella Turcica.

—W. Hill, M.D.—Woman, aged thirty-two, was sent by Dr. Leonard Williams to St. Mary's Hospital for the operation of decompression of pituitary region. She was of massive build, and presented marked external signs of acromegaly in skull, face, limbs, etc. The skiagram showed great enlargement and flattening of the pituitary fossa with double outline. There was bitemporal hemianopsia. She suffered from drowsiness and marked mental hebetude. A large goitre was present.

A portion of the floor of the pituitary fossa was perforated with a mastoid hand burr of medium size after the sphenoidal sinuses had been opened (and their septum removed) through a tunnel made by submucous resection of the nasal septum: a Killian incision only was employed and made on the right side of the septum. On withdrawal of the burr after it had sunk into the fossa, mainly through the roof of the larger right sphenoidal sinus, there was a very free flow of venous blood, which was stopped by plugging with gauze dipped in adrenalin solution. On removing the plug a few minutes later the oozing was slight, and soon almost stopped. A large fresh marine sponge was inserted in the

¹ See p. 369.

naso-pharynx, but the sphenoidal sinuses were not plugged, as it was decided, after consultation with Dr. Williams and Mr. Graham, that even continuous oozing was preferable to damming up blood in the cranial cavity, and so increasing intra-cranial pressure. A severe hæmorrhage, unfortunately, occurred two hours later, and the loss was so great that the sphenoidal sinus was lightly plugged with gauze soaked in peroxide of hydrogen. As a good deal of hæmorrhage came on again later, and the pulse was bad, firmer plugging was resorted to and bleeding arrested, but the patient's condition became gradually worse, with marked collapse and syncope, evidently the result of increased intra-cranial pressure, and she died eight hours after operation.

Post-mortem: The convolutions on the vertex were flattened, and the pituitary fossa was found to be of enormous size, filled with a soft, apparently malignant growth into which hæmorrhage had taken place; the tumour, after emerging from the large ring in the dura mater, expanded to the size of a Victoria plum and merged in the base of the brain: its thin capsule was bulged anteriorly and to the right by a large hæmatoma. There was no blood anywhere in the subdural or subarachnoid spaces, but there was an excess of cerebro-spinal fluid. The unperforated part of the floor of the sella was bared and eroded, and showed no trace of dura mater. The right cavernous sinus was apparently intact, but the operation hole was close to it, and possibly a rotten vein leading from it to the opposite sinus was opened by the burr, or the bleeding may have been from the tumour itself.

The case was, as it turned out, quite unsuitable for operative interference, and well illustrates the dilemma with which one is confronted when severe bleeding ensues in pituitary fossa operations.

Dr. W. HILL added that in this case there was no protecting dura mater present, and that probably explained the tremendous hæmorrhage when the burr perforated the sellar floor. His view was that the purely endo-nasal Killian-Hirsch operation was not always the best. There was in the woman he was speaking of a condition specially favourable for that operation, however, in that she was an acromegalic and her anterior nares were very large, and there was no absolute necessity to resort to Mr. Graham's auxiliary incisions of either splitting the end of the nose or of slitting up one nostril. In an ordinary case, however, he would enlarge the anterior narial opening forwards and upwards, to get a wider proximal opening, as Mr. Graham had done in his second operation. If a general surgeon undertook a pituitary decompression it would be better for him to choose the Ollier or the v. Bruns operation of displacement of the external nose, because that would bring him an inch nearer to the floor of the pituitary fossa. For a rhinologist, however, there were no inherent difficulties connected with the Killian-Hirsch endo-nasal approach apart from hæmorrhage in acromegalic subjects. With increased experience one would probably come to look upon it as a fairly easy operation, but a large tunnel must be made so that one could touch the sellar protrusion with the finger. One must not resect too near the roof of the sphenoidal sinus, as there would be danger of wounding the optic chiasma—the real bugbear of these operations. The cavernous sinuses could be avoided by keeping to the middle line, but one must take one's chance as regards finding large inter-sinus veins, a very vascular malignant tumour, and absence of dura mater, a combination encountered in this instance and in several other recorded cases which had succumbed to hæmorrhage.

Mr. GRAHAM said he had been struck with the advantage of splitting the nose instead of working through the nostril. He advised the surgeon

who contemplated the operation not to attempt it through the nostril unless he first split the vestibule. And that splitting should be started by the median incision. Another disadvantage of the Hirsch operation was that the columella was there the whole time, and that caused a deviation of the instrument from the middle line. His incision to the tip of the nose only could be enlarged upwards if necessary, and then one would be brought almost as close to the tumour as by any other method. He had used peroxide of hydrogen for a considerable time, but did not believe much in it. Pressure was, in his view, better; nothing for bleeding in the sella turcica excelled plugging with sterilised gauze straight on to the spot, as one would plug any bone cavity.

Mr. WAGGETT said the Section should feel indebted to Dr. Hill and Mr. Graham for bringing forward their cases, which served to illustrate the fact that whereas the operative technique formed an interesting and tempting branch of nasal surgery, the general subject of pituitary disease was still in its infancy. At the present time it was not even known how much of the gland could be removed without producing infantilism. It was to be hoped that at the International Congress in August the literature would be brought up to date.

Mr. PIKE said that five years ago in Vienna he saw Prof. Eiselsberg do an operation on such a case in a woman; Prof. Tandler, the Professor of Anatomy, devised the operation first on the cadaver, and was present at the operation, as also was the radiographer. The head of the patient was lying over the end of the table, in the surgeon's lap, and he operated through the nose.

Mr. O'MALLEY said that when in Vienna he had seen Hirsch do one of his cases, and there were certain features of the technique which struck him at the time as being somewhat extraordinary. The operation was performed in the out-patient department of the ear clinic at the Allgemeine Krankenhaus, under local anæsthesia, and the patient sitting upright on a stool. The septal route indicated by Dr. William Hill in the diagrams shown that day was the one adopted. It was done with biting forceps; he did not see a chisel used. Soft adenomatous material was taken away, and the patient was sent back to the ward. Three weeks later the patient seemed to be doing well. There was not more hæmorrhage than one saw in submucous resections.

Case of Pituitary Growth.—C. I. Graham. F.R.C.S.—S. P—, aged forty-three, is under the care of Dr. Wilfred Harris for failing eyesight of six years' duration, giddiness and frontal headaches, dull and heavy in appearance, but answers quickly and intelligently; amenorrhœa thirteen years; none of the usual external signs of acromegaly. She is unable to read, write, or sew, and can only distinguish faces of persons close to her. Her field of vision, left eye for white, has definitely contracted since 1907, while the right eye is blind, except for large white objects in upper nasal field. The left pupil reacts well to light thrown in any direction; the right pupil reacts badly to light. She has right optic atrophy and left optic neuritis. There is ptosis of both eyes. On February 2, 1913, 8 oz. of glucose were administered by mouth; 42 oz. of urine were collected in the succeeding twenty-four hours, which showed no trace of sugar, the specific gravity being 1020. Skiagram shows enlargement of sella turcica with apparent erosion of dorsum sellæ.

The exhibitor intends to perform a decompressive operation by the nasal route when the mouth is in a more healthy condition.

THE VIENNA LARYNGOLOGICAL SOCIETY.

Meeting of January 10, 1912; Monatss.f. Ohrenh., Year 46, No. 10.

PROF. CHIARI *in the Chair.*

Abstract of Proceedings.

A Woman after Removal of a Tumour of the Hypophysis Cerebri under Local Anæsthesia by the Author's Method.—Oskar Hirsch. The patient was a girl, aged sixteen, who before the operation, six weeks previously, showed well that fatty deposit in connection with the genitalia and disturbance of sexual functions associated with this anomaly—catamenia had not yet commenced. Loss of sight accompanied by headache had occurred some three years ago, and when first seen in November, 1911, the following note was made: Right, temporal hemianopsia, vision $\frac{1}{10}$; left, blind. In this month the right middle turbinal was removed, and a week later the hypophysis was approached by way of a submucous septal resection. The mucous membrane separated easily, and the sphenoidal sinus was then exposed with a chisel and the opening completed with punch forceps. The posterior wall was now seen to be bulged forwards within 1 cm. of the anterior boundary by the tumour. This was removed in a similar way for an area about $1\frac{1}{2} \times \frac{3}{4}$ cm. and then the dura beneath split, the tumour lifted out and a portion of its tissue taken away. As there was reason to suppose the tumour was of a large size a glass tube bent at right angles was then introduced in firm application with the surface of the growth, whilst its other end was connected with an aspirating apparatus, and thus the remainder of its contents evacuated. A strip of iodoform gauze was then laid in between the layers of mucous membrane. The histological report was that the growth consisted of an adenomatous tumour of the anterior lobe of the hypophysis cerebri. During the first fortnight the temperature gave some anxiety, reaching as high as 40.5 C., but apart from this the convalescence was uneventful, and at the end of the fourth week the patient appeared in exceedingly good health. Her vision was now $\frac{6}{24}$, whilst instead of her previous lazy indifference she became active and most communicative. Her weight, before the operation 64 kg., now was only 58 kg., and a normal growth of hair appeared in the axillæ and over the mons veneris.

He had considered that the tumour must be of large dimensions from the fact that although the X-ray picture only showed a moderate enlargement of the sella turcica, yet the optic chiasma was involved, and this structure did not lie in the sulcus as usually described in anatomy books but about 1 cm. further forward. In support of this latter point he showed a photograph of a median sagittal section from a hardened specimen prepared by Prof. Hochstetter.

As the vision had not much improved the lesion of the optic nerves must have been so severe as to permanently destroy more power of recovery.

He had performed this operation eighteen times with two deaths, and Spiesk had lately published an account of another with a good result. He knew of fifty-four operations on the hypophysis by other methods, twenty-two of which had died.

Meeting of March 6, 1912.

A Man, aged Sixty-five, with Dyspnœa. — Marschik. — Examination showed a yellow cylindrical tumour attached to the inner and anterior aspect of the first tracheal ring, rather to the left side, of cartilaginous hardness, and not associated with any inflammatory signs. As the patient would not allow an approach from outside it was removed with the thermocautery *viâ* the larynx. It was probably a chondroma or chondro-sarcoma, but the histological report was not yet to hand.

A Man, aged Forty-two, with Slowly Increasing Right Exophthalmos for the last Six Months. —The patient had been sent on from the eye clinic as he had a nasal discharge associated with polypi. As investigation of the nose did not discover any cause in this region, and there was reason to suspect an intra-orbital growth, an exploratory operation was performed, which revealed a definitely encapsuled tumour lying to the inner side of the orbit and reaching back almost to the optic foramen, which was easily removed with a snare. In structure it proved to be a *cavernous angioma*. The exophthalmos was immediately restored, the œdema slowly subsided and the vision and movements were now normal.

A Histological Examination of the Temporal Bones, from a Case in which Bilateral Bony Stapes-ankylosis was Diagnosed during Life (Otosclerosis). — Gustav Brühl. —Sandwiched between a long critical and historical survey—surely of little other value than as testimony to the exhaustive monographical research of the author (and, by the way, the excellent classic by Denker is not mentioned)—and a discursive debate as to the correct terminology and pathology of the condition, Brühl gives a most excellent description of some sections taken from a young single woman, aged thirty-nine.

The patient was admitted to the Dalldorf Lunatic Asylum with religious mania on March 1, 1911. She was the youngest of a family of fifteen. A gradually progressive deafness had commenced at her nineteenth year. She had slight tinnitus but never giddiness, and there was no spontaneous nystagmus. No other instance of deafness in the family was known. The objective examination revealed nothing abnormal, and the functional tests led to the diagnosis of "otosclerosis with bilateral stapes-ankylosis." Five months later the patient died of phthisis.

A histological account in great detail is supported by fourteen good illustrations. The areas of altered bony tissue were chiefly located between the cochlea and foramen ovale, the stapes fixed by bony-ankylosis most marked anteriorly, whilst the cochlear capsule and its contents were not, or only very slightly, involved—a similar condition occurring on either side. The new-formed bone-tissue and its associated blood-supply corresponded in appearance with other sections of otosclerosis, and thus the histological examination corroborated the diagnosis made *intra vitam*.

The argumentative discussion which centres around the purely laboratory point of view seems quite to have eclipsed the clinical import of this most interesting case, which illustrates above all the great parts which mental stress, physical strain and circulatory disturbances play in the ætiology of this condition. It would have been most interesting to have had sections of other parts of the skeleton.

Alex. R. Tweedie.

Abstracts.

PITUITARY GLAND.

Frazer, J. Ernest.—The Earlier Stages in the Development of the Pituitary Body. "Lancet," September 28, 1912, p. 875.

A short account, with more than usual detail, of the early state of the pituitary body. This body is, as everyone knows, formed by an upgrowth from the primitive mouth (Rathke's pouch), meeting a protrusion (the infundibulum) from the forebrain.

Before the end of the first (foetal) month there is a comparatively large and open recess passing up from the upper part of the early mouth cavity and placed in contact with the back aspect of the optic recess of the forebrain. This stage in the pituitary development is interesting, because it shows the definite relations to each other of the regions from which the parts of the complete structure will grow. This is described in detail in Frazer's paper, which requires to be read *in extenso* to be appreciated. The result of this growth is that, in the middle of the third month, the originally simple stomodæal pouch has been divided into a pharyngeal part in the roof of the naso-pharynx and the free edge of the septum, and an upper intra-cranial part that is forming the "glandular" portion of the pituitary body. The intermediate or basal part of the pouch disappears in the base of the skull. The occasional presence of a bony canal suggests that it may sometimes persist, though it is not improbable that this may be only a persistence of vascular tissue in some cases. The cavity of the infundibular growth apparently disappears during the third month, the process being composed mainly of neural cells continuous with those in the floor of the third ventricle, but with a layer of fibres on their ventral side. In the fourth month fibres have appeared among the cells. To sum up: during the second and third months Rathke's pouch, at its dilated upper end, grows up on both sides of an infundibular or neural process, and encloses its proximal part, leaving its distal end freely projecting behind. At the same time lateral groups of epithelial processes spring from the front aspects of the pouch margins, and a central group from its front aspect between these. The lateral groups extend from below upwards, and thus reach the cornua that enclose the neural part, and in the interval thus occurring between them as they pass backward the central group comes to the surface. The groups, enlarging, form the great mass of the gland in the fourth month and push the cavity to the back, where it lies under the neural portion. The buccal portion loses its connection with the naso-pharynx about the beginning of the third month or later, but a persistent tract remains below the skull running down the back of the nasal septum to the angle between the latter and the soft palate. Frazer has never seen any tendency of the neural part to invade the buccal portion, or to throw out any processes whatever.

Macleod Yearsley.

Lodge, S.—Cases Illustrating some Intra-cranial Conditions of General Interest. "Brit. Med. Journ.," March 16, 1912.

In this paper seven cases of disease of the pituitary gland are recorded.

Acromegaly was the chief clinical manifestation of five of these, and adiposity with sexual infantilism of the reversive form of the remaining two.

One patient suffered from "uncinate fits." The report of an autopsy made on a subject of acromegaly with gigantism presents some interesting details of the morbid anatomy of the larynx, nose and ear in that particular syndrome.

The transphenoidal route was adopted for draining a pituitary cyst in two patients. In one an osteoplastic flap of the nose was turned to one side; and, in the other, the nose was turned up by a large sublabial approach. The septum nasi was removed with its mucosa attached in both operations. The writer would strongly recommend in preference to either of these methods that elaborated by Cushing.

The sublabial incision is not more than 2 cm. in length. The septum is removed submucously through a submucous resection speculum, the cavum sellæ is entered, and the floor of the pituitary fossa removed; hæmorrhage is arrested, the septal mucosæ fall together, and the sublabial incision is closed. One of Cushing's patients after a simple decompression resumed her occupation after an interval of seven days. Cushing further points out that a sellar decompression facilitates radiotherapy, applied through the nares; and, in states of hypopituitarism, will reduce the amount of pars posterior gland-substance required for efficient opotherapy.

Author's Abstract.

McCarthy and Karsner.—Adeno-carcinoma of the Thyroid with Metastasis to the Cervical Glands and Pituitary: A Contribution to the Pathology of Abnormal Fat Formation. "Amer. Journ. Med. Sci.," vol. cxliv, No. 6.

Among the clinical varieties of excessive and aberrant fat formation, the form known as Adiposis dolorosa was found by the authors to be associated with lesions of the pituitary, thyroid, and sexual organs, and of seven cases examined *post-mortem* by other observers, lesions of the thyroid consisting of atrophy with compensatory hypertrophy were noted in all, while tumours of the pituitary were present in three cases and pathological lesions of the gland in two others.

Similar features are presented by some of the other varieties of lipomatosis, and while one of the cases here described appeared to represent an intermediate type between adiposis dolorosa and adiposis cerebialis, and showed an adeno-carcinoma of the pituitary body, the other (described in much detail) presented features of the three groups—adiposis cerebialis, symmetrical adeno-lipomatosis, and adiposis dolorosa—and was associated with adeno-carcinoma of both thyroid and pituitary glands. In this second case the lesion of the pituitary was regarded not as a metastasis from the thyroid, but as the result of a compensatory over-action, followed by a degenerative process predetermined in its nature by an already existing similar condition in the thyroid.

Thomas Guthrie.

Hirsch, Oskar (Vienna).—The Operative Treatment of Tumours of the Hypophysis Cerebri by Endonasal Methods. "Archiv für Laryngol.," vol. xxvi, Part III.

In this important paper Dr. Hirsch gives a detailed account of the pioneer work on which he has been engaged during the past three years. His experience of operations on the pituitary body by the endonasal route is unique, and the present paper is based on a series of twenty-five cases treated in this way. Four of the cases have been already reported

(*Archiv für Laryngol.*, vol. xxiv, 1910), but the description of them is here repeated in full, together with details as to their subsequent history.

Cases of tumour of the hypophysis may be divided into three groups, according to the symptoms which they exhibit: (1) Cases of well-marked acromegaly, with enlargement of the hands, feet, nose, tongue and jaw, thickening and pigmentation of the skin, increase of hair on the body, enlargement of the larynx (hoarseness) and of the thyroid gland. The sexual functions are altered, and disturbances of vision are common. (2) Degeneratio adiposo-genitalis. Increase of the body-fat together with loss of sexual function, and very often certain trophic changes, such as falling out of the hair, brittleness of the nails, disturbances of sweat and urine secretion, and lethargy. Visual disturbances are the rule. (3) Disturbance of vision without *striking* changes in the general condition. Even in these cases, however, careful inquiry will almost always disclose the presence of one or more of the symptoms mentioned in the second group. The visual disturbance takes the form in this, as in the other groups, of diminution of acuity and contraction of the visual field. The latter shows itself very frequently as a bitemporal hemianopsia, and is as such almost pathognomonic of pituitary growths. In the early stages colours are alone affected.

The diagnosis of pituitary tumours is based on a consideration of the general symptoms presented by the case, a careful examination of the eyes, and the discovery by radiography of a widened sella turcica.

In approaching the hypophysis by the endonasal route the choice lies between two methods—the ethmoidal and the septal. In both local anæsthesia is employed. The first is carried out in three or four separate stages at intervals of a few days as follows: (1) Excision of the middle turbinal of one side; (2) removal of the posterior and some of the anterior ethmoidal cells of the same side, so as to lay bare the whole anterior wall of the sphenoidal sinus; (3) removal of the latter so as to expose the widened sella, which is opened either at once or in a fourth stage. In the septal method, approach to the sphenoidal sinus, and so to the pituitary body, is obtained by a submucous resection of the septum. Both sphenoidal sinuses are opened in the mid-line, and the whole operation is carried out in one sitting, unless narrowness of the olfactory fissure renders necessary a previous removal of both middle turbinals. This method entails less risk than the ethmoidal of infection from the nasal cavities. It was employed by the author in all the cases except one. In performing the operation the most scrupulous aseptic precautions are observed, the instruments being re-sterilised at frequent intervals during the course of the operation. Anæsthesia is secured by the application of cocaine and tonogen solutions, and by infiltration, with Schleich's No. 2 solution, of the whole septal mucosa from the sphenoidal sinus forward to the membranous septum. The operation is carried out with the patient in the sitting position. After removal of the greater part of the cartilaginous and bony septum, and the rostrum sphenoidale, the anterior wall of the sphenoidal sinuses is cut away. This exposes the widened sella turcica, in which a transverse incision is now made with a chisel, and through this a special hook-shaped elevator is passed and inserted between bone and dura. By traction with the elevator the bony shell of the tumour is broken away, and it is further removed with cutting-forceps so as to expose as large an area of dura as possible. A flap of dura is turned down, and the tumour pierced in order to discover whether or not it is cystic. If it is, as much of the cyst-wall as possible is excised. If solid, the tumour is removed with the curette, the latter

being used mainly in a downward direction, and only with the greatest gentleness laterally and upward. The operation is completed by the insertion between the muco-periosteal flaps of a strip of iodoform gauze. The patient leaves hospital in from eight to ten days.

The results of the operation are considered in reference to the operative mortality and to the influence exercised on the disease. The author performed twenty-six of these operations (one of the twenty-five cases being operated on twice), with a fatal result in three cases—a mortality-rate of 11·5 per cent. By the addition of two cases operated on by Spiess and Holmgren the mortality is reduced to 10·7 per cent. This compares very favourably with the mortality-rate shown by other methods of operation, which varies from 13·7 per cent. (Cushing) to 37·8 per cent. (Schloffer's method). Of the author's three fatal cases, one died on the twentieth day after operation of meningitis, the patient, who was maniacal, having removed the nasal plug and thus probably caused infection of the wound. The second case died on the eighth day from acute pneumonia, while the third death occurred shortly after the operation from hæmorrhage into the third ventricle, and was thus clearly the direct result of the operation.

In reference to the effect produced by the operation on the disease, the author's records show three cases in which the condition remained unaffected, five in which a temporary improvement (lasting two to six months) took place, and fourteen in which the improvement—very marked in some of them—still persists. The chief benefit consisted of restoration of vision and recovery from mental disturbances.

The outcome of these operations depends on the nature and extent of the tumours and on the power of recovery of the optic tracts and nerves. Cystic tumours and those that are wholly or mainly intra-sellar give the best results.

In the author's opinion resort should be had to operation in all cases of tumour of the pituitary body with progressive visual disturbance, whether the tumour appears, as shown by radiography, to be chiefly intra-sellar or chiefly intra-cranial. The indications are less clear in cases of acromegaly without visual disturbance, but in view of the intra-sellar situation of the tumour in such cases, there should be good prospect of permanent cure, especially if future work shows a further reduction in the operative mortality.

Thomas Guthrie.

Lee, John Robert.—**Cyst of the Pituitary Gland, with Pressure Symptoms; Operation; Recovery.** "Australian Medical Journal," October 26, 1912.

This case is of interest on account of the route followed in the operation for the removal of a cyst of the pituitary gland. It will be evident that such a route might be followed in dealing with certain diseases of the sphenoidal sinus. The patient was a girl, aged ten, suffering from polyuria and symptoms of intra-cranial pressure, *e. g.* headache, vomiting, giddiness, and impairment of vision. Operation: The upper lip was retracted, and an incision about an inch long was made down to the base of the vomer. The muco-periosteum of the vomer and ethmoidal plate was separated by means of very small, then increasing sizes of, Hegar's metal dilators. The nasal septum, including the vomer and ethmoidal plate, was nipped out piecemeal. As space was obtained by removal of bits of the septum the dilators were pushed on until gradually the muco-periosteum from both sides of the septum was separated intact.

The whole of the vomer and ethmoid plate was removed until ultimately the basi-sphenoid was reached. A good view of the base of the skull in this region was obtained by keeping the passage open with a long Killian's speculum, the light being thrown in from a forehead mirror. Hæmorrhage was effectively controlled by swilling with pure peroxide of hydrogen. The V-shaped process of the articulation of the vomer with the sphenoid was a guide to the proper locality on sphenoid. An opening with a small trephine into the sphenoidal sinus was continued through its posterior wall into the sella turcica. A cyst cavity containing three drachms of clear fluid was opened into. Through preserving the mucoperiosteum of the septum the nasal fossa was not opened into, and the probabilities of sepsis avoided.

A. J. Brady.

E.A.R.

Jones, Hugh E.—The Operative Treatment of Aural Vertigo due to Causes other than Suppuration. "Liverpool Medico-Chirurgical Journ.," July, 1912.

Ablation of the labyrinth for non-suppurative aural vertigo was first performed by Lake in 1904, and since then not more than about twenty cases have been done. An operation, which differs in having for its object the reduction of tension in the labyrinth by simple opening of the perilymphatic space of the external semi-circular canal with preservation of auditory and vestibular functions, was performed by Jenkins in 1911.

Suitable cases for ablation seem to be those pure labyrinthine cases, in which the vestibular organ still responds to experimental stimulation, and in which recurrent attacks interfere with their duties in otherwise healthy persons, where the hearing is good in one ear and defective in the other, and where falls are likely to be dangerous and the symptoms cause severe mental distress. Unsuitable cases are those in which rapid and complete destruction of the vestibular function has occurred, and also functional and toxic cases and those with lesions of the central nervous system. Aural vertigo, resulting from lesions of the external or middle ears, should be rather treated by attention to these regions. Even in cases of true Ménière's disease, old age, or severe general disease, or an inability to refer the symptoms definitely to one ear, operation is contra-indicated.

Lake obtained his object of complete destruction of the branches of the vestibular nerve by first doing a radical tympano-mastoid operation, and then opening the vestibule both above and below the aqueductus Fallopii.

The author, however, considers this unnecessary. By his method the antrum is first freely opened as in Schwartze's operation until the inner wall is exposed and a good view of the prominence of the external semi-circular canal obtained. This is opened by Lake's chisels, and its outer wall removed forwards into the vestibule. The vestibular cavity is curetted, especially its upper posterior and internal walls with the ampullary openings of the superior and external canals. The posterior limb of the external canal can also be followed backwards and the ampulla of the posterior canal destroyed. The cavity is swabbed out with an antiseptic fluid and the wound closed, being drained until the stitches are removed on the fourth day. The author has operated on four cases by this

method. The first three were reported in the *Proceedings of the Royal Society of Medicine*, March, 1912.

The fourth case, an adult male, was operated on in February, 1912. He had suffered from repeated severe attacks of vertigo with partial deafness in one ear for a year. Ten days after operation the wound was healed, and the caloric reaction absent on the operated side. At the time of writing the vertigo was cured, the ear was completely deaf, and there was a slight tinnitus.

A. J. Wright.

Day, Ewing W.—Subdural Drainage in Purulent Meningitis and Brain Abscess: Reports of Two Cases, with Autopsies. "Annals of Otology, Rhinology and Laryngology," vol. xx, p. 394.

The conclusions drawn from Dr. Day's two cases are: (1) Dural drainage is effective over a limited area, but extends some distance beyond the drain. (2) These dural areas were found at the autopsy comparatively normal. This is probably due to the fact that the dural drain is most active at first, and ceases after thirty-six to forty-eight hours, probably caused by the blocking of the arachnoid spaces leading to the drained area, which also protects it from re-invasion. (3) To be effective in general meningitis many drains on both sides of the skull would be necessary. Without having had an opportunity to test it, lavage of the cerebro-spinal subarachnoid spaces, as proposed by Barr, appeals most strongly to the writer.

Macleod Yearsley.

REVIEWS.

The Pituitary Body and its Disorders: Clinical States produced by Disorders of the Hypophysis Cerebri. By HARVEY CUSHING, M.D., Associate Professor of Surgery, the Johns Hopkins University, &c. Pp. 341. 319 illustrations. Philadelphia and London: J. B. Lippincott Company. Price 18s. net.

Within recent years the surgical attack upon pituitary tumours has proceeded by way of the sphenoid. Within recent years, also, the knowledge of the disturbances, local and constitutional, produced by pathological states of the hypophysis has taken giant strides. For these reasons we propose to devote an amount of space greater than usual to the review of Prof. Cushing's book, the most comprehensive and authoritative on the subject which has so far appeared. In doing so, we shall not attempt to give more than an abstract *résumé* of the matters therein treated. For details we refer the reader to the book itself.

Anatomically the pituitary body is developed in two parts—the *anterior*, originating like the thyroid gland from an epithelial outgrowth from the bucco-pharyngeal cavity; and the *posterior*, formed from the base of the anterior cerebral vesicle (the neuro-hypophysis or *pars nervosa*). In the subsequent development of the fœtus the anterior or pharyngeal portion is cut off from its site of origin by the growth of the bone of the sphenoid, and comes to embrace the *pars nervosa* like a cup and ball. This dual constitution of the gland persists throughout life and the line of cleavage between them can be demonstrated without difficulty, although as a matter of fact this line of cleavage does not precisely represent the division between the two parts, for the anterior supplies a

pars intermedia which adheres so intimately to the *pars nervosa* that the line of division when it is made comes to be between the anterior lobe and the *pars intermedia*. The neuro-hypophysis, *pars nervosa* or posterior lobe is connected with the tuber cinereum by means of the infundibulum in which is contained the infundibular recess continuous with the cavity of the third ventricle of the brain, into which apparently the secretion of the posterior lobe passes.

Histologically the three parts differ from each other. The anterior lobe is composed of columns of eosinophile, basophile and neutrophile cells surrounding large sinusoidal blood-spaces—an arrangement which suggests that the secretion of this part of the hypophysis passes direct into the circulation. The thin *pars intermedia* is made up of neutrophile cells, which tend, here and there, to form acini containing a colloid material, which colloid material has been traced by Cushing through the substance of the *pars nervosa* (which is largely neuroglial in structure) as far as the ventricle. It is believed that this colloid material is the secretion of the posterior lobe (if we look upon the *pars intermedia* as part of the posterior lobe), and that it finds its way into the ventricles and so finally into the cerebro-spinal fluid.

In a manner which recalls the thyroid gland, accessory pituitary glandules may be found in adult life anywhere between the infundibulum and the pharynx, and it is the incomplete involution of the pharyngeal stalk which produces the familiar pouch of Rathke. In addition to vestiges such as these which are occasional, there are others which seem to be constant: one a small epithelial body—the pharyngeal hypophysis—situated in the mucous membrane just behind the alæ of the vomer, and, in dogs at all events, a small “parahypophysis” lying in the dura. These bodies may possess some physiological function.

Physiology.—It was Pierre Marie's work on acromegaly (1885-1890), that first drew attention to the internal secretion of the hypophysis.¹ The following is a summary of the results and opinions hitherto obtained and at present held.

The *single* injection into the circulation of an extract of the whole gland leads to a general rise in blood-pressure from contraction of the arterioles all over the body. This arteriole contraction, however, does not affect the kidneys, where, indeed, the vessels are actually dilated, a phenomenon which, coupled with a simultaneous stimulation of the renal epithelium, leads to free diuresis. The general arteriole constriction is part of a general stimulation of involuntary muscle-fibre which is manifested also in uterine, vesical and intestinal contractions.

In addition to these effects, there is noticeable also a lowering in the assimilation limit for carbohydrates, and a galactagogue action.

The *repeated* use of injections of the whole gland extract in animals is followed by emaciation and some other changes of minor interest. Skeletal overgrowth, the acromegalic type, has not so far been produced by administering the gland extract to healthy animals.

Extirpation of the Gland.—Complete removal is followed by death, and partial removal by the series of changes which are known as *hypopituitarism*. These changes vary according to whether the animal is young or adult. In the young animal there is a general increase in adiposity, increased tolerance for sugar, lowered body temperature, skeletal undergrowth, psychic dulness, and a persistence of sexual in-

¹ See “Essays on Acromegaly,” by Dr. Pierre Marie and Dr. Souza-Leite; also “Acromegaly,” by Dr. Maximilian Sternberg, both of which are easily accessible to English readers in the New Sydenham Society publications.—D.M.

fantilism. In the adult similar disturbances occur, the place of the last-mentioned phenomenon being taken by regressive sexual changes. These experimental results find their correlative in diseases of the pituitary in man. Before puberty, for example, hypopituitarism from disease induces a symptom-complex corresponding to those just mentioned in young hypophysectomised animals; it is known as "Fröhlich's type" of pituitary disease.

With regard to the tolerance for sugar induced by an insufficient pituitary secretion a word of amplification is necessary. The glycogenic function is influenced by the secretion of the posterior part of the gland, since injection of the extract of this lobe is followed by glycosuria, while its diminution (whether experimental or pathological) leads to a high tolerance for sugars, a deficient glycogenolysis, and the resultant accumulation of fat in the body.

Pathology.—Acromegaly and gigantism have been supposed to be due to an increase in the secretion of the anterior lobe of the pituitary. But as these states may occur without any great increase in the bulk of the gland this view has been doubted. At the same time it is possible that hypersecretion may exist without an enlargement of the gland, just as Graves's disease may occur without a goitre. In Graves's disease, however, the structure of the thyroid is pathologically altered, and similar alterations have not so far been clearly demonstrated in the pituitary. The reason for this is that the extreme variability within the limits of health in the histological appearances of the pituitary render the pathological appearances of the gland tissue difficult to determine. Cushing suggests that acromegaly may be due to a perverted rather than to an increased pituitary secretion.

Apart from pathological changes in the gland itself—many of which, it must be remembered, are quite obvious—disturbances of the function of the pituitary giving rise to recognisable symptoms may result from a simple increase in intracranial pressure from whatever cause arising.

Clinical Manifestations of Pituitary Disease.—The disturbances which proceed from pituitary disease may, like those produced by the disorders of the thyroid body, be divided into constitutional and local.

Logically, one would naturally divide the constitutional symptoms into two types, viz. *hyperpituitarism*, when the activity of the gland is increased, and *hypopituitarism*, when it is depressed. But although it is possible to assign certain of the symptoms to one or other of these categories, Cushing notes that in actual fact the cases tend to show a blending of the two varieties, although in the final stages of a completed case the signs incline to end in hypopituitarism. Thus exactitude is best served by applying the term *dyspituitarism* to all.

Classification of Cases of Dyspituitarism.—Cushing suggests the following tentative classification (his phraseology we have taken the liberty of altering):—

- (1) Cases with signs of local pressure coupled with symptoms of altered glandular activity.
- (2) Cases with signs of local pressure, but with few or no symptoms of altered glandular activity.
- (3) Cases with few or no signs of local pressure, but in which pronounced symptoms of altered glandular activity are present.
- (4) Cases of involvement of the pituitary body secondary to some other brain lesion.
- (5) Cases of polyglandular disease—the pituitary being affected along with the other ductless glands of the body.

Each of these classes may be further subdivided according to the preponderance of hyperpituitarism or hypopituitarism in the symptoms.

As our knowledge of the diseases of the gland increases, the future will doubtless witness a further division, according as the anterior or the posterior lobe is chiefly affected. The anterior lobe presides over skeletal growth, and is related to the other ductless glands, while the posterior lobe participates in the body metabolism—since insufficiency of its secretion leads to adiposity—and influences the activity of the renal and vascular systems.

The greater part of Cushing's book is made up of a series of forty-seven case-narratives of pituitary disease, the thoroughness and completeness of which render them a model of clinical reporting.

Analysis of Symptoms. Local Symptoms and Signs.

Headache.—The typical headache of pituitary enlargement Cushing refers to the distension of the gland capsule. Besides being intense and constant it is bitemporal in situation, and so differs materially from the headache of cerebral tumour. If the capsule is destroyed by the disease headache may be absent.

Deformity of the Sella Turcica.—In order that the sella turcica may be properly examined many X-ray pictures taken from different angles must be taken. Cushing strongly advises a stereoscopic picture taken from the side and above the level of the pituitary fossa. If single plates only can be obtained the focus should be directly over the hypophysis and perpendicular to the sagittal plane.

If in the radiogram the profile measurements exceed 15 mm. antero-posteriorly and 10 mm. from above downwards, enlargement of the sella may be assumed. It is possible in some cases to observe, by successive radiograms taken at intervals, a progressive enlargement of the fossa.

There are three types of deformity of the sella turcica:

(1) Thickening of the clinoid processes and dorsum ephippii—mostly found in acromegaly.

(2) Thinning of these parts from pressure atrophy. The thinning is denoted by diminution in the intensity of the bony shadows. It is mostly found in hypopituitarism.

(3) Destruction, more or less, of all the outlines, when absorption of the sellar base and deformity of the sphenoid may be noted.

In primary glandular hypoplasias in the young the sella may be abnormally small, and then heavy shadows, especially of the dorsum, are cast.

Visual Disturbances are the most frequent of all the symptoms.

Primary atrophy of the optic nerve occurs, but without any cedema until late in the course of the case, when the tumour has become large enough to block the foramina of Monro. As the amblyopia is generally due to a physiological block of the optic nerve and not to an actual destruction of the nerve-fibres, vision may be restored by timely operation.

Perimetric Deviations.—There is bitemporal hemianopsia, but it is irregular in outline and in Cushing's experience rarely showed the so-called typical vertical meridian traversing the macula. Indeed, uni-ocular amblyopia with little or no perimetric deviation in the other eye may be observed, and homonymous defects are not unusual. Stress is laid upon a tendency to temporal defects in early cases, especially in the colour peripheries. In all the cases the colour-fields were first involved and the

form-fields later. The macular area is often spared for a considerable time.

Motor ocular changes may occur, and anosmia, trigeminal neuralgia, spasticity, etc., may result from the extension of a tumour.

Naso-pharyngeal Symptoms.—Epistaxis occasionally appears and may be troublesome. One of the most interesting symptoms from the rhinologist's point of view is an intermittent discharge of mucus into the pharynx. As a consequence, many patients have been subjected to prolonged treatment for some sinus disease, and the author suggests that "many of the recorded instances of primary optic atrophy in supposed association with disease of the sphenoid may thus be accounted for" (p. 247). Operation showed that, in four or five instances, on removing the anterior walls of the sphenoidal sinuses a retained mass of white tenacious mucus was "expelled from the cavity at each side of the projecting sellar base, which extended so far downward as to partly occlude the sphenoidal" ostia.

In a few cases the tumour was found to protrude into the naso-pharynx.

In dyspituitarism associated with primary glandular insufficiency there may be a tendency to adenoid formation.

Cerebro-spinal Rhinorrhœa has been observed in one or two cases. In the ordinary course no cerebro-spinal rhinorrhœa follows the trans-sphenoidal operation, as the denuded area is soon covered with mucous membrane.

Constitutional Effects of Dyspituitarism.—We have already glanced at these manifestations and now proceed to examine them more minutely.

Skeletal Overgrowth.—Although not universally accepted, the view which ascribes this condition to functional hyperplasia of the pars anterior is supported by most of the evidence.

In cases where gross and obvious changes are not present or are doubtful, radiograms of the phalanges are of great value as they may reveal acromegalic changes in these bones (thickening of the shaft, etc.). In general, acromegalic bone changes are of a reactionary character—secondary to the mild traumatism of muscles and tendons.

Skeletal undergrowth, which is of course due to hypopituitarism, naturally shows itself only when the glandular insufficiency occurs prior to adolescence. In that event the stature remains low and the genitals retain their infantile characters. If the insufficiency comes on during adolescence not only do the long bones fail to grow to their normal length, but the skeleton takes on a feminine type, with broad pelvis and genu valgum, and with a tapering type of hand. In these cases the X rays show that the epiphyseal lines have failed to ossify. The growth is arrested. This change should be contrasted with the opposite conditions of gigantism and acromegaly.

Changes in the Skin and Subcutaneous Tissues.—With *hyperpituitarism* the skin is greasy and moist, the hair-follicles increase, and there is hypertrichosis. As the case progresses towards *hypopituitarism* a slow and often imperceptible change takes place. The skin becomes dry, smooth, and transparent, the axillary and pubic hair becomes scanty and the nails become thin.

Adiposity is sometimes so excessive as to dominate the clinical picture. It is a hypopituitary change, and is ascribed, as we have already seen, to an increased sugar tolerance. It is associated with subnormal temperatures. Although the deposit of fat is general in its distribution, it is most obvious in the subcutaneous tissues.

There are several types of the condition, the differences being due to the presence of other symptoms. Many excessively fat children, for example, are suffering from dyspituitarism, and in adults some of the cases of adiposis dolorosa may be ascribed to the same cause.

Influence on Carbohydrate Metabolism.—The hyperplasias are productive of glycosuria, and as polyuria and polydipsia may also appear, the clinical manifestations may be those of diabetes. In an interesting section Cushing demonstrates how the hitherto puzzling appearance of glycosuria after head injuries is due to trauma of the pituitary body.

The *body temperature* is generally lowered and the patients complain of a feeling of chilliness. In animals, when the anterior lobe is deficient, a definite thermic response follows the subcutaneous injection of extract of this lobe. In human patients, in like manner, a rise of temperature to the normal has been found to follow the administration of the whole gland extract. This phenomenon, the author suggests, might be tried as a clinical test for pituitary disease.

Psychic Changes.—Apart from the pressure effects of tumour, dyspituitarism sets up definite mental changes. In hyperpituitarism the patient is wakeful, restless, undecided, irritable, and lacks concentration. In hypopituitarism, on the other hand, he is drowsy, somnolent, and insensitive to painful stimuli. An utter lack of appreciation of and complete indifference to his illness is one of the characteristic signs. In most cases of hypopituitarism sufficient to cause adiposity some degree of intellectual depression exists, and the mental changes may be so marked as to amount to insanity. In others, however, the patient when roused is intelligent enough.

Epilepsy is a common symptom, and seems to be a feature of hypopituitarism, apart altogether from the fact that the mechanical irritation of a pituitary tumour may also induce epileptiform seizures. In two of the cases gland feeding was found to reduce the frequency of the fits. A suggestive collection of facts bearing on the relationship of the pituitary body to epilepsy appears on p. 274.

Symptoms referable to other Ductless Glands.—Every pituitary disorder elicits secondary polyglandular manifestations due to atrophy of some and hypertrophy of others of the glands. Some of the symptoms found in the cases are attributable to these secondary factors.

The Sexual Glands.—Except in tumour cases with pressure symptoms, the changes due to interference with the sexual glands may precede the true pituitary symptoms. These changes naturally vary with the age of the patient. If the disease begins before puberty there is an imperfect acquisition of the secondary sexual characteristics; if after puberty, amenorrhœa, impotence and regressive sexual changes appear. These changes, however, are not always associated with a disappearance or absence of the normal reproductive powers.

The Adrenals.—In many cases pigmentation of the skin, asthenia and other phenomena suggestive of adrenal trouble are evident.

The Lesion in the Hypophysis.

As we have already seen, variations in the structure of the gland are considerable even in health. Consequently, apart from tumour formation, it is often difficult, and sometimes even impossible, to draw the line between a normal and an abnormal hypophysis.

With regard to tumour formation the following two classes are differentiated:

(1) *Homoplastic Growths*, comprising hypertrophies of the gland, adenomas or "strumas," etc.

(2) *Heteroplastic Growths*, probably originating from some vestige of the pharyngeal diverticulum.

(1) *Homoplastic Tumours*.—The adenoma seems to be the most frequent type of pituitary tumour. It is sometimes called "round-cell sarcoma," but it is non-malignant, and shows no tendency to infiltration. In the growth of the tumour the dural envelope is destroyed. As in the goitrous thyroid, the tumour is prone to secondary degenerations. In this way may arise the cystic tumour of the pituitary, the form which is most amenable to operation.

These changes are associated with hypopituitarism from insufficiency in the gland secretion. Sometimes the earlier symptoms, however, are those of hyperpituitarism.

(2) *Heteroplastic tumours* arise either from some developmental vestige—as we have already seen—or they grow from some other structure in the neighbourhood of the sella turcica.

Treatment.

The treatment depends on the nature of the disease. Pituitary headache may be met by simple sellar decompression. Ocular symptoms, due to pressure on the optic chiasma, may necessitate exposure and partial extirpation of a tumour, usually adenoma, while hypopituitarism, without any local symptoms, may only need the internal administration of the gland. These measures can be combined in any given case.

The Surgical Measures to be adopted must also vary with the type of the disease, no one operative measure being suitable for all cases. Thus, symptoms of an increase in general intracranial pressure will necessitate a subtemporal decompression operation, and this should always precede an operation upon the sella turcica when the general pressure symptoms are at all marked.

When there are obvious local pressure symptoms the sella turcica should be attacked. The routes which have been followed and the methods adopted in so doing are as follows:

(a) *Subtemporal Route*.—This route, by which access to the tumour is made by raising the frontal lobe of the cerebrum, necessitates an operation difficult to perform when a large tumour has led to high intracranial tension. But it is, nevertheless, indicated if marked local symptoms co-exist with a normal sella, as shown by the X rays, for the probability is that in these circumstances the tumour is one of the extra-pituitary type, and is situated above the gland, so that its successful removal from below would involve the operative destruction of the hypophysis.

(b) *The Transphenoidal Route*.—To reach the sella through the sphenoid some operators approach the area by means of incisions, more or less extensive, through the external aspect of the nose, with exenteration of the ethmoidal cells. But the risk of meningitis and the subsequent deformity have led to the selection of a route by means of submucous resection of the nasal septum. Various incisions have been adopted. Hirsch, of Vienna, operating in two or three *séances* under cocaine, begins, as in the Killian submucous resection, by making the incision in the septal mucosa on one or other side. Cushing employs Halsted's sublabial incision. His method is as follows:

Under ether anaesthesia, administered through a laryngotomy or tracheotomy opening, the septal mucous membrane is raised, and the septal cartilage and bone removed in the usual manner. Cushing points

out, however, that in acromegalic patients the anterior maxillary spine is larger than in health, and its removal causes free hemorrhage, for which wax may be necessary. Dilators of the Hegar type are passed in between the septal flaps in order to flatten the turbinals when they are large, as they usually are in acromegaly.

In the deeper regions of the septum the operator should keep his line of approach to the sphenoid low, following the posterior margin of the vomer, in order to minimise the risk of entering the posterior ethmoidal region—an error which led to meningitis in one of Cushing's cases. Having identified the sphenoidal attachment of the septum and the prow of the vomer, these parts are removed with cutting forceps, and the body of the sphenoid exposed. The anterior and inferior walls of the sphenoidal sinuses are then cut away with *rongeurs* and their mucous lining removed. This done it is easy to recognise the downward bulge of the sella turcica, even when there is no pathological distension of that fossa. The floor of the sella, which is usually very thin, is then removed, and the capsule disclosed. After hæmostasis a crucial incision is made with a "knife-hook" in the dural covering of the gland or tumour. The mode of dealing with the tumour varies with its character. It is important before closing the wound, etc., to assure one's self that all the bleeding has stopped. There is no necessity for any drainage. The septal flaps are allowed to fall together and the buccal or nasal incision is closed by suturing.

Difficulties arise when the sphenoidal cells are abnormally small, and when the bone is thick. On one occasion Cushing feared he had gone too low and had passed through the basilar process. So he inserted a "silver clip" in the opened floor of the cranium and stopped the operation. Subsequent X-ray examination showed the clip to be in the floor of the sella, and the operation was ultimately completed with success.

Methods of Dealing with the Lesion.—Infrasellar tumours from a pituitary "rest" can be entirely removed. Simple sellar decompression with splitting of the gland capsule may be all that is necessary. Pituitary cysts, which are rare, can be opened and evacuated. Attention is drawn to the fact that a true pituitary cyst may be simulated by an arachnoid cyst containing cerebro-spinal fluid on the surface of a tumour, the opening of which will endanger the meninges. Infundibular cysts are out of the reach of the transphenoidal operation.

Sellar decompression may be effected, together with the partial removal of an adenoma. This is often easy, the mass being spooned out with but little difficulty. And further growth, if it takes place, is encouraged in a direction away from the brain.

If the transphenoidal operation does not reveal an obvious cyst or tumour, even when the sella is enlarged, but brings us to what seems to be a flattened hypophysis, the operation should be stopped, a piece of the tissue taken for examination, and if it prove to be pituitary tissue the subtemporal route must be resorted to. In most of those cases, however, the need for an intracranial operation is plain from the outset, for the pressure symptoms are out of all proportion to the degree of sellar deformity.

The subtemporal operation upon this region is not yet perfected. Only once did Cushing succeed in reaching the pituitary region by this route, and then no interpeduncular tumour was found (p. 306), and only once did a *post-mortem* show the operation to have been feasible.

Results.—Hirsch has operated on twelve cases, with three deaths, and

as one of the fatal cases had been diagnosed erroneously, his actual mortality thus amounts to 16.6 per cent. In Cushing's series the operation mortality was 13.7 per cent.¹

Summary of Surgical Measures.

(1) Sellar decompression suffices for (a) persistent pituitary headache; (b) to guide a growing tumour away from the brain.

(2) Partial removal of a hyperplastic gland may be undertaken in the active stage of hyperpituitarism.

(3) Partial removal of a pituitary tumour will relieve local pressure symptoms.

(4) Subtemporal decompression is called for if the tumour is one of the pedicle, or if a true hypophyseal tumour has extended some way upwards towards the brain.

(5) Finally, in profound hypopituitarism, Cushing, with apparent success, implanted in the cerebral subcortex a gland from another source (p. 320).

Thus the chief service of operative surgery is to relieve local pressure; secondly, to palliate the results of the increased intracranial pressure; thirdly, to reduce the size of the gland in hyperpituitarism.

Other Therapeutic Measures.

Gland Administration.—The internal administration of pituitary extract, a preparation difficult and expensive to prepare, is, of course, only useful after the hyperpituitary stage has passed. The whole gland extract is best at present, but as progress is made it may turn out to be possible to give one or other portion of the gland, according to the symptoms present in any particular case. In the matter of dosage—an uncertain point at the moment—some guidance may be obtained by an estimation of the patient's sugar tolerance. Cases are narrated in which this treatment, especially when combined with operation, proved to be of service.

Radiotherapy.—Some amelioration of pressure symptoms was occasionally obtained by the X rays given through the nares and from the side through the temporal region.

Conclusion.—That we, departing from our usual custom, have devoted so much space to an abstract review of Cushing's book, is sufficient proof of the high value we set upon his work, and it would be but "wasteful and ridiculous excess" to gild this sincerest of all compliments with vain repetitions of mere laudatory phrases. That being so, we hope the distinguished author will not take it amiss if we close our review with an appeal to him to cultivate, for his readers' sake, a simpler and more natural style of writing English. Germany is doubtless the home of thorough scientific work and method, but if we follow, in the arrangement and expression of our ideas, the laboured and top-heavy literary style of that country's writers, we are likely to cause unnecessary weariness in the minds of our readers.

Dan McKenzie.

Klinik der serösen und eitrigen Labyrinth-Entzündungen. Von Dr. ERICH RUTIN, Assistent an der Universitäts-Ohrenklinik in Wien. 23 figures and 196 pages. Vienna and Leipzig: Josef Safar.

In this little book—little only by virtue of the extraordinary compression of its contents—both the junior student in the otological

¹ For later percentages see page 380.

department and the aural surgeon will find an explicit account of the intricacies which surround this complex section of our work. Chapter I is devoted to the routine tests which the author adopts for the cochlear and vestibular nerves coupled with an explanation as to their rationale and significance—an excellent introduction to the subject and set forth in a manner eminently intelligible to anyone possessed of that elementary anatomical and physiological knowledge which it is quite fair to presuppose. Whilst all other tests are treated in detail no allusion is made to the galvanic reaction—an intentional omission apparently, and one which serves to enhance the practical value of the treatise, as this test is probably more of academic interest than clinical worth.

Ruttin describes the inflammatory changes in the labyrinth as follows: (1) Circumscribed labyrinthitis (that, so to say, physiological state when a fistula and nothing else exists); (2) diffuse serous secondary labyrinthitis (a condition which may supervene on the former); and (3) diffuse purulent labyrinthitis (which may be either manifest or latent). The pathology, ætiology, symptoms, differential diagnosis and respective treatment of all these are discussed in order and then summarised in tabulated form. Yet another condition is further separately alluded to under the term “serous induced labyrinthitis,” such being in part the result of propinquity and occurring in the course of acute middle otitis, of chronic middle otitis, during the convalescence from the radical operation and persisting a short while after the same.

Possibly the indications here given for the labyrinth operation if read alone are a little too dogmatic, but the author evidently intends the warning contained in his introduction in this section to be always kept steadily in view—“*primum nil nocere*”—and the question “How shall we operate?” is, he urges, of less importance than “When shall we operate?” His method of operating is concisely and clearly described in a few words with the aid of six good figures. This penultimate chapter of the monograph is concluded by a survey of the results of treatment, both expectant and otherwise, which at once furnishes admirable advice to the over-ambitious, and may provide some solace to others in cases where patients or their friends prefer to run unwarrantable risks.

No treatise of course on disease of the labyrinth is complete without reference to intracranial complications, and in this respect certain rules of procedure are suggested which should prove of great help in both locating and dealing with the inflammatory focus.

As ample testimony to the practical work on which this monograph is based the notes of 108 cases are appended to instance conclusions and point morals—indeed, throughout the book one cannot but admire the manner in which clinical facts are utilised to support method and treatment.

The mists of theory still, of course, hang over this department of aural surgery in spite of all the enormous work recently done, for a very large portion of which we are indebted to the indefatigable efforts of the Vienna school: and it is with quite pardonable pride that Prof. Victor Urbantschitsch alludes to this research in a preface to the book. No one certainly will wish in any way to dispute his claim to this distinction, or begrudge the credit due to our Austrian colleagues in this respect. He does not, however, suggest for a moment that this treatise is complete, or that it constitutes the last word on the physiology, pathology, or treatment of labyrinthine function and disease,—indeed he urges that there is still much scope for further investigation, and hopes that, whilst this account may help towards the practice of aural surgery, it will also

stimulate others towards the extension of our knowledge in this direction.

There is no hesitation whatever in thoroughly recommending the work to all who may be interested in the subject and are anxious to master the mysteries of the labyrinth and its pathological diversities.

In addition the work forms an excellent preface to Neumann's similar monograph on "Cerebellar Abscess," and these two together form complementary and companion accounts which should endure as classics in otological literature.

Alex. R. Tweedie.

BRITISH MEDICAL ASSOCIATION.

EIGHTY-FIRST ANNUAL MEETING, BRIGHTON.

July 22, 23, 24 and 25, 1913.

SECTION OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

President: Arthur Jaffray Hutchison, M.B., Brighton; Vice-Presidents: Harold Shuttleworth Barwell, F.R.C.S., London; Claude Edward Woakes, M.R.C.S., London.

The following subjects have been selected for special discussion:

Wednesday, July 23, 10 a.m.—Discussion: "The Technique and After-Treatment of the Radical Mastoid Operation."

Thursday, July 24, 10 a.m.—Discussion: "The Care of Patients after Operations on the Nose and Naso-pharynx and the Complications of these Operations."

Friday, July 25, 10 a.m.—Papers.

The Hon. Secretaries are: A. J. Martineau, F.R.C.S.Ed., 22, Cambridge Road, Hove; W. S. Syme, M.D., 10, India Street, Glasgow; E. D. Davis, F.R.C.S., 81, Harley Street, W.

NOTÆ SUBSCRIPTÆ.

Among the distinguished recipients of the recent Royal Birthday Honours we are interested to observe the name of our esteemed colleague, R. H. Woods, of Dublin.

Both for his contributions to oto-laryngology and for his work in the Presidential Chair of the Royal College of Surgeons, Ireland, Sir Robert Woods thoroughly merits this recognition, and on behalf of his fellow-specialists both at home and abroad we beg to tender to him our heartiest congratulations.

Dr. A. Logan Turner, of Edinburgh, was elected a Corresponding Fellow of the American Laryngological Association at the recent meeting of the Association held at Washington, on May 5-7 last.

PITUITRIN LOCALLY.

Pituitrin, the extract of the pituitary body (posterior lobe), resembles adrenalin in some of its physiological effects. In the circulation it markedly stimulates the force of the heart-beat, causes peripheral vascular constriction (save in the kidneys), and so heightens blood-pressure. It seems also to stimulate involuntary muscle in the uterus, intestine, bladder, etc.

Applied locally, however, to the mucous membrane of the nose, *e.g.*, I have observed that, unlike adrenalin, it exercises no obvious influence upon the blood-supply of the parts.

D. M.

FRONTISPIECE.



MORELL MACKENZIE,
THE FOUNDER, WITH NORRIS WOLFENDEN,
OF THE 'JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.'

THE
JOURNAL OF LARYNGOLOGY,
RHINOLOGY AND OTOTOLOGY.

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THE CONGRESS NUMBER.

THE occasion of the meeting of the XVIIth International Congress of Medicine in London this month provides an opportunity of casting a glance back over the road that our specialties have travelled in Britain since they first left the parental home of general medicine and surgery. For this reason the whole of the present issue of the JOURNAL OF LARYNGOLOGY, RHINOLOGY AND OTOTOLOGY is given up to a series of articles historical in character, which, when compared with the long list (p. 433) of clinics now in active operation in Britain, may serve to indicate to our foreign visitors and readers, as well as to future workers, the level to which our special knowledge has attained, and the extent to which it has become disseminated throughout the length and breadth of the land at the present day.

The historical articles, for which we are indebted to writers whose names are household words wherever otology and laryngology are household topics, have been constructed mainly with the object of demonstrating and emphasising the influence of British investigators upon the development of special sciences. In doing so, the authors have as far as possible confined their attention to the achievements of men who have either retired from active practice, or have definitely "passed into history"—a limitation which is, of course, dictated by a desire to avoid the delicate task of appraising the work of living men.

In the case of rhinology, however, the extreme youth of this branch of medicine has naturally rendered it impossible to treat of it otherwise than by discussing the work of living men, but in the full and exhaustive *résumé* we owe to Drs. Logan Turner and W. G. Porter, there will be found, we believe, few or no omissions of any importance.

With regard to the illustrations we beg to express our most grateful thanks to Sir William Dalby, Sir Felix Semon, Prof. Urban Pritchard, Dr. de Havilland Hall, Dr. T. J. Walker (Peterborough), Dr. Laidlaw Purvis, Mr. Macleod Yearsley, and the family of Sir George Johnson for the loan of photographs, and Mr. R. Kershaw for permission to select from his unique collection of portraits the pictures of Toynbee, Wilde and Hinton, Sir Morell Mackenzie, and Lennox Browne.

In conclusion, we desire in the name of British oto-laryngology to extend to our colleagues from foreign lands, to our cousins from across the Atlantic, and to our brethren from over the Seven Seas, the heartiest of welcomes. May their sojourn among us lead to the furtherance of knowledge, the perfecting of skill, the formation and deepening of friendship, and the strengthening of the ties that make not only for scientific but also for political brotherhood!

THE HISTORY OF RHINO-LARYNGOLOGY IN GREAT BRITAIN.

BY SIR STCLAIR THOMSON,

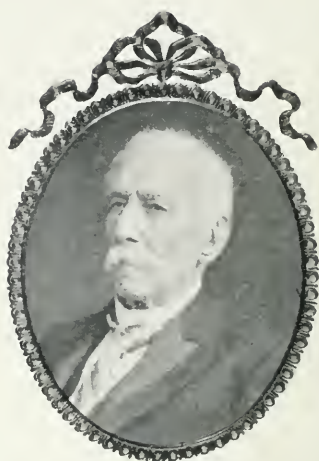
President of the Section of Rhinology and Laryngology, Seventeenth International Congress of Medicine, London, August 6-12, 1913.

WE are generally agreed that laryngology originated in 1885, and owed its creation to the discovery of Señor Manuel Garcia. It was happily indicative of the cosmopolitan character of our speciality that Garcia was a Spaniard by birth, that he made his discovery in France, that he first published the invention in England, and that medical laryngoscopy was perfected in Vienna and Buda-Pesth and first presented to the world in an article in the *Wiener Medizinische Wochenschrift* on March 27, 1858. But Manuel Garcia lived long in this country, and was known to many of us in his later years: he now takes his last sleep in English soil, so that the inventor of the laryngoscope came to be particularly identified with this country. Garcia died on July 1, 1906, in the 102nd year of his age. He is buried in the churchyard adjoining St. Edward's Chapel at Sutton Place, near Woking, in the beautiful county of Surrey.

But long before the middle of last century efforts had been made in England to see the living larynx, and important contributions had been made by rhinologists and laryngologists. So long ago as the year 1651 Highmore had given his name to the maxillary sinus, and in 1698 Cowper had shown how it could be opened and drained from a tooth-socket. In



GARCIA, WHEN HE INVENTED THE
LARYNGOSCOPE.



GARCIA, AGED 100 YEARS.



LENNOX BROWNE.

the eighteenth century the suggestion to open the maxillary antrum from the nose was made by John Hunter, the founder of the wonderful pathological museum in the Royal College of Surgeons in Lincoln's Inn Fields.

In 1829 Dr. Benjamin Guy Babington showed his "glottiscope" to the Hunterian Society of London. He used a laryngeal mirror, very similar to those used at the present day, and on this he concentrated the sun's rays by means of a common hand looking-glass. There are no cases recorded in which Babington's laryngoscope was employed, although we know that he used it on many patients, and a method which depended on so uncertain a luminary as the sun—particularly in this climate—could not be expected to secure any general adoption.

Another distinct objection was that it demanded the use of the operator's two hands, the right one holding the laryngeal mirror, while the left manipulated the hand-glass.

Liston was a great surgeon who, in 1840, recorded that when treating œdematous tumours in the larynx he endeavoured to obtain a deeper view "by means of such a glass as is used by dentists on a long stalk, previously dipped in hot water, introduced with its reflecting surface downwards and carried well into the fauces."

In 1844 Warden employed prisms in an endeavour to inspect the interior of the larynx, but came to the conclusion that his method would give no assistance. About the same time Avery was attempting to see the vocal cords by principles which were sound, although his methods were insufficient. He used a frontal mirror, but only to increase the luminary power of a candle, and his laryngeal mirror was not mounted on a shank, but fixed in a cumbersome speculum.

It is curious that no one interested in throat affections had thought of applying the principles of the ophthalmoscope, invented by Helmholtz in 1851. Señor García was at that time teaching singing in Paris; he had no medical or scientific training, and, doubtless like many before him, he was anxious to perfect his study of the throat by seeing "a healthy glottis exposed in the very act of singing." How his wishes became realised was graphically described by him before the Sub-section of Laryngology at the Seventh International Congress of Medicine, held in London in 1881, and was given in such simple but picturesque language that I cannot do better than quote García's own words. He says: "One September day, in 1854, I was strolling in the Palais Royal, preoccupied with the ever-recurring wish so often repressed as unrealisable, when suddenly I saw the two mirrors of the laryngoscope in their respective positions, as if actually present before my eyes. I went straight to Charrière, the surgical-instrument maker, and, asking if he happened to possess a small mirror with a long handle, was informed that he had a little dentist's mirror, which had been one of the failures of the London exhibition of 1851. I bought it for six francs. Having obtained also a hand mirror, I returned home at once very impatient to begin my experiments. I placed against the uvula the little mirror (which I had heated in warm water and carefully dried), then, flashing upon its surface with a hand mirror a ray of sunlight, I saw at once to my great joy the glottis wide open before me, and so fully exposed, that I could perceive a portion of the trachea. When my excitement had somewhat subsided, I began to examine what was passing before my eyes. The manner in which the glottis silently opened and shut, and moved in the act of phonation, filled me with wonder."¹

¹ *Transactions of the Seventh International Medical Congress, London, 1881, vol. iii, p. 197.*

With the invention of the laryngoscope fifty-eight years ago, the art and science of laryngology was founded. We have lost most of those who brought back to this country the first laryngoscopes from Vienna and Buda-Pesth, but we are happy in having still amongst us one of these early pioneers of laryngology. Dr. T. J. Walker, of Peterborough, who was one of the secretaries in the Section of Laryngology when the International Congress of Medicine met in London thirty-two years ago, is still in full practice (Plate). If I have read the history of laryngology aright it was Dr. T. J. Walker who, as seen in the *Lancet* for November 9th, 1864, recorded the first published case of removal of a polypus from a vocal cord by the endolaryngeal route. This, he is noted, was done without the aid of either chloroform or cocaine!

Dr. T. J. Walker's co-secretaries in 1881 were Dr. Felix Semon and Dr. F. de Havilland Hall (Plate). Dr. Hall has somewhat forsaken laryngology for the wider subject of internal medicine, but Sir Felix Semon is faithful to laryngology, which he has served so well, and of which he remains the welcomed and honoured *doyen* (Plate).

The late Sir George Johnson, who presided over the Sub-section of Laryngology in 1881, made a valuable contribution to the question of laryngeal neuroses (Plate). The clinical work of Morell Mackenzie and Lennox Browne is well known, and their text-books were recognised throughout Europe.

Henry Butlin's name will always be associated with the surgery of laryngeal cancer.

With the mention of these names we arrive at the present-day history of rhino-laryngology in this country. It would be both difficult and invidious to attempt a consideration of the contributions made to the speciality by the many earnest workers in Great Britain. Their number and enthusiasm is shown by the value of the *Transactions of the Laryngological Section of the Royal Society of Medicine*, which numbers nearly 200 members. Scotland has its own special Society of Oto-laryngology. An Irish laryngologist, Sir Robert Woods, has earned such distinction in our special work that he has lately received the well-earned honour of knighthood; and "gallant little Wales" presents in Dr. D. R. Paterson a laryngologist of such culture and merit that he is now the president-elect of the Section of the Royal Society of Medicine.

The work done and being done in Great Britain bears the character of the nation. It is noticeable for its practical character, for the quick adoption of any idea or procedure which promises ready application in practice, for the instinct to simplify complicated methods, and for its humanity. As I remarked in Berlin in 1911, it is to a large extent true that the gold of science is mined in Germany, minted in France, and put in circulation by the English!

THE FOUNDATIONS OF BRITISH OTOLOGY.

BY MACLEOD YEARSLEY, F.R.C.S.,

Senior Surgeon to the Royal Ear Hospital, etc.

THE occasion of an International Congress of Medicine in London is the opportunity for taking stock of what British science has done in the past in the various departments of medical work. When one looks over the history of otology in the United Kingdom during the past century one



SIR GEO. JOHNSON *President*).



SIR FELIX SEMON *Secretary*).



DR. F. DE HAVILLAND HALL *Secretary*).



DR. T. J. WALKER *Secretary*).

EXECUTIVE OFFICERS, LARYNGOLOGICAL SECTION, INTERNATIONAL MEDICAL CONGRESS, LONDON, 1881.

finds much to be proud of, and can realise that our country has played a foremost part in one of the youngest of the great special branches of medicine and surgery.

Until the seventeenth century—indeed it is not an exaggeration to go further and say until the nineteenth century—otology was very empirical, and had scarcely passed out of the domain of quackery. Sir William Wilde, writing in 1853, remarks that “the affections of the ear, whether functional or organic, are spoken of, lectured on, written of, and described (even in great part to the present day), not according to the laws of pathology which regulate other diseases, but by a single symptom, that of deafness.” This quotation is a very true one, and demonstrates the unscientific condition of otology up to within comparatively recent times.

The fact that the names of the earlier pioneers of aural anatomy—Eustachius, Vesalius, Ingrassia, Columbo, Fallopius, Koiter, Varolius, Fabricius, Rivinus, Brendel, Zinn, Cotugno, Scarpa, Sömmering, Corti—are all foreign, has helped to hide much of the progress of otology due to British scientists, and has partially veiled the names of such men as Munro, Tod, Home, Shrapnell, Buchanan, Wharton Jones, Wallis, Petit, Cleland, and others.

Otology has practically no history worth mentioning before the eighteenth century, although John of Gaddesden recognised the importance of drainage in treating middle-ear inflammation sufficiently to recommend that, in cases of discharge, one of the lower classes should be hired to suck out all the morbid material of the ear by means of a tube in the meatus! It may be noted, in this connection, that Fallopius (1523-1562) first taught that a discharge of pus from the ear of a child should not be meddled with, as it was an effort of Nature to throw morbid material out of the head through the ear! A teaching that may have formed the foundation of that pernicious doctrine of the unwisdom of “stopping a discharge” that even now survives among the ignorant, and is responsible for numerous fatalities and destruction of hearing.

It is difficult to trace the rise of British otology from its emergence out of the slough of empiricism and quackery to its present position as a scientific speciality based upon a solid foundation; one can only take the names of British otologists in chronological order and note what they have achieved. If this be done, it will be found that many advances popularly attributed to our continental *confrères* have in reality originated in our islands.

A notable instance of this fondness for referring British discoveries to foreign countries is the so-called “German system” of deaf education, now designated, more appropriately, the “oral system.” It is a fact that this method of education was in use in England and Scotland in Dr. Johnson’s time, and is mentioned by Boswell in his biography. This was long before it was even thought of in Germany. But one may go still further, and say that a full century before Dr. Johnson visited Braidwood’s school in Edinburgh, and was pleased with the way in which a deaf scholar pronounced one of the lexicographer’s *sesquipedalia verba* written upon the board, long before the conger of states was welded into the German Empire, an Englishman was educating deaf children to speak. John Wallis, Savilian Professor of Geometry at Oxford, and one of the founders of the Royal Society, exhibited to Charles II, in 1663, a “deaf and dumb” youth, Daniel Whalley, the son of a friend, whom he had taught to speak and to understand speech. Wallis’s method was applied in a few other cases,

and its origin may be traced to his treatise, "De Loquela," on the methods of production of articulate sounds.

In 1680 Thomas Willis first drew attention to the symptom of hearing better in a noise (paracusis Willisii).

J. L. Petit, a British surgeon, was the first, according to Schwartze, to open the mastoid for the evacuation of pus, an operation which he performed between 1750 and 1774. Although the history and development of the mastoid operation has been rather the achievement of Continental surgery, it is interesting to know that it is to Great Britain that the earliest record of this valuable surgical advance is to be attributed.

Another great advance in otology originated practically with a British surgeon. It is true that Guijot, the postmaster of Versailles, invented the first form of Eustachian catheter in 1724—he used it upon himself through the mouth; but it was Archibald Cleland, an English army surgeon, who, in 1741, advised injections *viâ* the Eustachian tube, and used probes for its exploration. According to Wilde it is certain that Cleland was the first to introduce the catheter through the nose. He was also the first to use a lens for the examination of the ear. In 1755 another British surgeon, Jonathan Wathan, reported cases of Eustachian catheterisation, without, apparently, knowing anything of Cleland's work on the same subject.

Alexander Munro (1797), Professor of Anatomy, Medicine, and Surgery in the University of Edinburgh, claims to have been the first anatomist to trace the auditory nerve within the cochlea, vestibule, and semicircular canals, and wrote a monograph on the organ of hearing in man and the other animals.

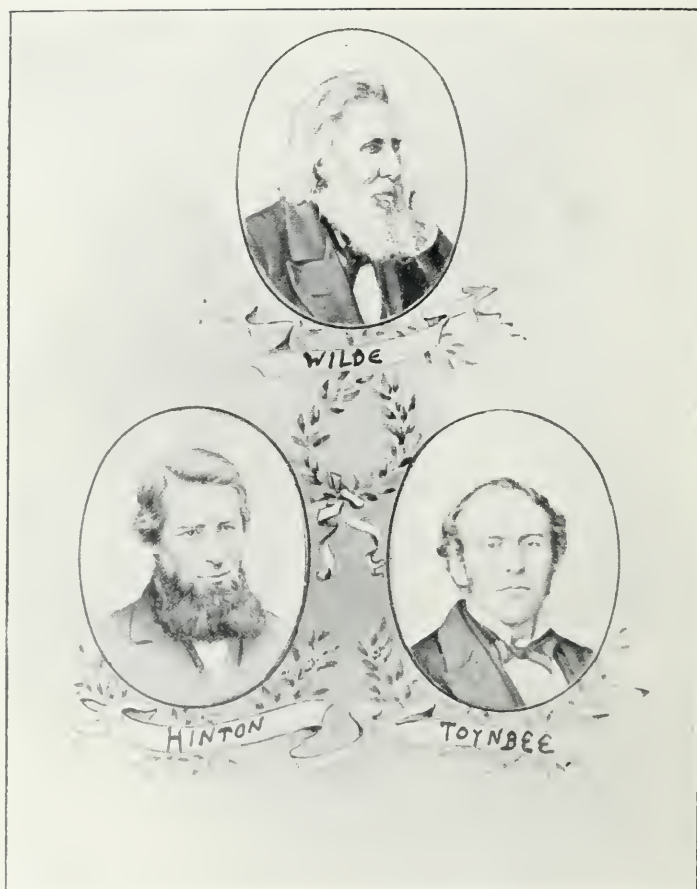
David Tod, who wrote three treatises on the brain, the eye and the ear, published in London and Edinburgh in 1797, also contributed essentially to the anatomy of the ear.

Sir Everard Home, Hunter's son-in-law, was the first to write an exact account of the tympanic membrane, published in the *Philosophical Transactions* for 1800, and it was he who suggested to Sir Astley Cooper the operation of perforation of the membrane. John Cunningham Saunders also, in his work on the ear, which is brief, scientific, and far beyond its predecessors, advocated paracentesis in acute suppuration of the middle ear. He was the first, in March, 1805, to establish an infirmary for the deaf, the work of which was, however, limited later to the eye.

In 1816 John Harrison Curtis founded the Dispensary for Diseases of the Ear, which later became the Royal Ear Hospital, for Diseases of the Ear, in 1841, when the late Queen Victoria became its patron. Curtis was succeeded about the year 1845 by William Harvey, who died of carbuncle in December, 1876. This hospital can, therefore, lay claim to being the oldest special hospital in existence. Curtis published a treatise on the physiology and pathology of the ear in 1836.

In 1832 Henry Jones Shrapnell first described, in the *Medical Gazette*, that part of the tympanic membrane which is known by his name. Between that date and 1823 the most noteworthy production of British otology was a book upon diseases of the ear, published by Thomas Buchanan, of Hull. This surgeon published four works.

Between 1836 and 1839 T. Wharton Jones contributed a very valuable monograph upon the ear to "The Cyclopædia of Anatomy and Physiology" (edited by Robert B. Todd), and in 1839 Joseph Williams won a gold medal from the University of Edinburgh for his monograph on the anatomy, physiology and pathology of the ear.



WILDE. HINTON. TOYNBEE.

The early Victorian period, into which we have now entered, was, however, the dawn of modern British otology, and Grunert, in a letter to the *Lancet* (1900, ii, p. 1826), acknowledges that the English otologists were the first to promote the study of otology on a sound scientific basis. At least six great names must endure as inseparable from the rise and growth of British otology—William Harvey, James Hinton, George Pilcher, Joseph Toynbee, William Wilde, and James Yearsley—whilst it would be invidious to mention those who, still living, have advanced the work to its present state. To these six surgeons I propose to devote some detail. Of William Harvey I have been unable to find any obituary notice, save a short paragraph noting his death in the *Lancet* of 1876. His name is not to be found in the "Dictionary of National Biography," save in a note, to be referred to later, on Pilcher.

James Hinton was born at Reading in 1822. In 1838-9 he was cashier in a woollen drapery in Whitechapel, after which he became a clerk in an insurance office. Slaving at what must have been an uncongenial occupation, he devoted his nights to study, becoming later a student at St. Bartholomew's. Taking his M.R.C.S. in 1847, he spent some time at sea, his prospects clouded by an unrequited attachment to a Miss Haddon, who twice rejected him. He next began practice in Bartholomew Close in partnership with Fisher, paying special attention to aural surgery. His life became brighter when Miss Haddon succumbed to his third entreaty and married him in 1852. In 1854-5 he delivered a course of lectures on "Sound," and, in 1856, began a literary career by papers on physiology and ethics. To otology he contributed his "Atlas of the Membrana Tympani," "Questions of Aural Surgery," and translations of v. Tröltsch's "Surgical Diseases of the Ear," and of Helmholtz's "Mechanism of the Ossicles and of the Membrana Tympani," published by the Sydenham Society. In 1875 he began to suffer from brain trouble due to overwork, and started on a voyage to the Azores, only to die on December 16, 1875, of acute inflammation of the brain.

George Pilcher, born in 1801, obtained his M.R.C.S. in 1824, and began at once to practise as a surgeon in Dean Street, Soho. He was appointed lecturer on anatomy, physiology and surgery at the West Street School of Medicine, and became consulting surgeon to the Surrey Dispensary. In 1838 he was awarded the Fothergillian Gold Medal of the Medical Society of London for a valuable essay on the structure and pathology of the ear. He was President of the Medical Society in 1842, and became lecturer on surgery to St. George's Hospital in 1843, in which year he received the F.R.C.S. on the foundation of that diploma. He died in 1855. In the "National Dictionary of Biography" it is said that he "entered upon the practice of aural surgery at a time when the quackery of John Harrison Curtis had raised that speciality to an unenviable notoriety. To Toynbee, Pilcher, Yearsley and Harvey, aural surgery in this country mainly owes . . . its position."

The name of Joseph Toynbee, otologist and philanthropist, must ever stand out among British otologists. Born in Lincolnshire in 1815, he obtained his M.R.C.S. in 1838. His aural studies began during student life, letters from him, signed "J. T.," appearing in the *Lancet* of 1836. After acting as assistant to the late Sir Richard Owen at the Royal College of Surgeons, he became surgeon to the St. James's and St. George's Dispensary, where he established a Samaritan Fund. For his researches demonstrating the non-vascularity of articular cartilage he was made F.R.S. in 1842, and in 1843 he became one of the first Fellows of the Royal College of Surgeons. Commencing practice in Argyll Place,

he removed later to Savile Row, and was appointed aural surgeon and lecturer upon diseases of the ear to St. Mary's Hospital in 1852, a post which he resigned in 1864. He was, besides, aural surgeon to Earlswood Asylum for Idiots, and consulting aural surgeon to the Asylum for the Deaf and Dumb. His work in otology is mainly valuable for its anatomical and pathological investigations, and a lasting monument of his labours is to be found in the famous Toynbee collection in the Museum of the Royal College of Surgeons. His valuable life was prematurely ended on July 7, 1866, from the accidental inhalation of chloroform whilst experimenting to find out a method of relieving pain in acute inflammation of the ear. His work has, however, won lasting fame, and, according to St. John Roosa, it was his observations on the muscular action required to open the Eustachian tube that led Politzer to his method of inflation.

A name scarcely less great than Toynbee is that of William Robert Wills Wilde, who was born at Castlereagh, Co. Roscommon, in 1815. Apprenticed to Professor Colles in 1832, he became M.R.C.S.I. in 1837, after which he went for a voyage, of which he wrote the narrative. After study at Moorfields Ophthalmic Hospital, Berlin and Vienna, he settled in Dublin in 1841, where he founded the Hospital for Diseases of the Eye and Ear. In 1853 he published his standard work, followed later by a book on the eye. He wrote also upon non-professional subjects. Appointed surgeon to the Queen in Ireland and receiving the honour of knighthood, he died in 1876. His work did more to place otology on a sound basis than anything which had appeared since the days of Valsalva. He taught that the true nature of aural disease was inflammatory in a large proportion of cases, and, as St. John Roosa puts it, "Wilde deserves the title of the 'Father of Modern Otology.'" Fayette C. Ewing, writing on the "Progress of Otology in Fifty Years" in the *Laryngoscope* for 1903 (pp. 857-860) and noting the effects of Listerism in aural surgery, points out that Wilde knew and insisted upon the importance of cleanliness and drainage, and the advances made since his time hinge almost entirely upon antiseptics.

James Yearsley is now best known for the artificial tympanum which bears his name. But he did better work than that, and foreshadowed much of what is the basis of modern treatment and preventive work, the study of the naso-pharynx. Born in Cheltenham in 1805, he became the pupil of Ralph Fletcher of Gloucester (a man well known as a skilful surgeon and a collector of pictures), whose daughter he married. Later a student at St. Bartholomew's, he became M.R.C.S. and L.S.A. in 1827, L.R.C.P. Ed. in 1860, and M.D. St. Andrews in 1862. After a short period (1829-1837) in general practice—so valuable to the specialist—at Ross, in Herefordshire, he studied as an aural surgeon in Savile Row, founding shortly after the present Metropolitan Ear and Throat Hospital. He wrote several works on otology and on diseases of the throat, which, if less scientific than those of his contemporaries, are valuable for their sound doctrine regarding the origin of most cases of impaired hearing in the mucous membranes of the throat and ear. He insisted strongly upon the connection between deafness and diseases of the naso-pharynx and advocated the removal of tonsils. He died in 1869 and lies in the churchyard of his son's church at Sutton Bonnington in Leicestershire.

To carry this short sketch of British Otology beyond these men who laboured to establish it upon a firm and scientific basis would be beyond its scope. Sufficient has been said to demonstrate that our speciality owes much to British science. Its development and its future lie in able



JAMES YEARSLEY.



SIR WILLIAM DALBY *President*).



DR. PRITCHARD *First Secretary* .



DR. LAIDLAW PURVIS *Second Secretary* .

EXECUTIVE OFFICERS OF OTOLOGICAL SECTION, INTERNATIONAL CONGRESS OF MEDICINE,
LONDON, 1881.

hands, and, in more recent times, the names of Cresswell Baber, McEwen, Urban Pritchard, Dalby and others show how well the legacy of the early Victorian aural surgeons have been administered in trust for future generations. The future of British otology is safe; it is advancing and will advance, and the direction taken by that advance will be that of prevention.

A SURVEY OF THE WORK DONE IN BRITAIN ON THE DISEASES OF THE NASAL CAVITIES AND THEIR ACCESSORY SINUSES.

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IN reviewing British work in the domain of the nasal cavities, we shall refer in the first instance to investigations on the development and anatomy of the parts and to those dealing with physiology.

Anatomy and Physiology.—Among papers on development one by J. E. Frazer (1), published in 1910, on the early development of the Eustachian tube and naso-pharynx, is worthy of mention. He regarded the tube and middle-ear cavities as derived from a recess that was really part of the pharyngeal cavity containing in its walls first, second, and probably third arch elements, and therefore differing from the view generally held, that they are derived from the first inner cleft recess. In his investigations he made use of reconstruction models and serial sections.

Here, also, we may refer to a paper by W. G. Porter (2) (1907) on a fold sometimes to be found immediately in front of the posterior nares. The fold was first noticed on the normal side in a case of unilateral atresia of the choana, and it appeared to be a very slight degree of atresia on that side as well. Subsequent investigation showed that this fold was present in one out of three individuals, and the author suggested that it probably represented the remains of the bucco-nasal membrane, the persistence of which, as Haag pointed out, was probably the cause of congenital atresia.

An interesting investigation has been carried out by T. W. E. Ross (3) (1913) on the nerve supply of the inferior turbinal as shown by vital staining. He showed that the inferior turbinates have an abundant and complex nerve-supply, especially in the subepithelial area, where several varieties of nerve-endings are found, including a plexus formed by leashes of nerve-fibrils, best seen towards the anterior part of the turbinal.

A number of valuable researches have been carried out by British authors on the physiology of the nose, especially in relation to its respiratory functions. Although Aschenbrodt, of Würzburg (1886), was the first to examine the temperature and hygrometric conditions of the air after passing through the nose, Greville Macdonald (4) in 1888 made original observations on the same subject and obtained very similar results. He found that whatever the atmospheric temperature, the inspired air on passing through the nose alone was raised or lowered

approximately to that of the blood, and further, that the air became completely saturated with water.

Our views on this subject have had to be reconsidered as a result of an important and entirely original investigation carried out recently by A. Brown Kelly (5) (1913). He used extremely delicate mercury thermometers which responded at once to the slightest changes of temperature, hence the alternate changes produced by the colder inspired air and the warmer expired air were at once made evident. The bulb of the thermometer, which was bent at an angle to the stem, was introduced into the naso-pharynx while the stem projected from the mouth. The excursions of temperature with normal individuals varied from 1.5° to 6° F. His results thus differed from those of previous observers in that he showed that the temperature of the respiratory current in the naso-pharynx was not to be attributed solely to the warming action of the nose and naso-pharynx, but also to the expiratory current. He also investigated the thermometric phenomena in various diseased conditions of the nasal cavities.

The course taken by the air in passing through the nose was first examined experimentally in the cadaver by Paulsen and later by Franke, while Greville Macdonald has assumed that the course of the inspired air was through the middle meatus. Charles A. Parker (6) in 1901 undertook experiments in the living. To study the inspiratory current he puffed lycopodium in front of the nostrils while examining the nose, and to trace the expiratory current he made his subjects gently exhale cigarette smoke through the nose. Parker found that, during quiet inspiration in a normal nose, the air traversed the middle and superior meatuses, and that in expiration (contrary to Franke's observations) the air traversed chiefly the inferior meatus. He also found that inspiration and expiration were impeded, the former by spurs and deviations of the septum, enlargements of the middle turbinal, polypi, etc.; the latter by hypertrophies of the posterior end of the inferior turbinal and hypertrophies encroaching upon the inferior meatus. In an earlier paper (1893) Parker (7) investigated the breathing in nasal obstruction during sleep. He found that it was almost entirely nasal, even though the mouth was widely open, unless the obstruction was complete. He proved this by holding cotton-wool in front of the nose and mouth. John Adam (8) in 1911 wrote an interesting and ingenious paper suggesting that the sinuses as well as the turbinals had an important share in warming and moistening the air passing through the nose, especially in the forced respiration of exercise. His conclusions were based on repeated experiments and observations made after violent exercise. Under these circumstances the turbinals were found to have shrunk, and the author concluded that this was to permit of the warm air in the sinuses passing into the nasal cavities.

As bearing on physiology we may mention here that Thudichum (9) in 1868 introduced the nasal douche by applying Weber's discovery that the nasal channels act as the two arms of a syphon when the mouth is kept open.

Pathology and Bacteriology.—We may now turn to papers dealing with pathology and bacteriology. Morell Mackenzie (10) examined 2152 skulls in the museum of the College of Surgeons with a view to determine the frequency of exostoses. He found 170 examples of bony outgrowth originating from the septum, which sprang, as a rule, by a broad base from the septum. The situation of the tumour was generally opposite the middle turbinal. In many cases these prominences formed

as it were the posterior spur of a bony ridge running along the septum at the junction of the ethmoid and the vomer. Ridges of this kind existed in 673 skulls (31.2 per cent. of the total number examined).

In 1899 H. Lambert Laek (11) contributed a valuable paper on fibrinous rhinitis and its relation to diphtheria. His paper was based on an investigation of thirty-six cases. He was able to show that the condition was much more common than had previously been believed. In his cases the Klebs-Löffler bacillus was constantly present and was of great virulence, being capable of producing toxins which were neutralised by diphtheria antitoxin; but with one possible exception he could not find a case in which diphtheria might have been the cause of infection, nor did any cases of unmistakable diphtheria occur in connection with them. He discussed the possibility of the Klebs-Löffler bacillus causing two distinct conditions, just as the tubercle bacillus causes lupus as well as the ordinary tuberculous lesions.

Among other investigations is one (1901) by Knowles Renshaw (12) on nasal tuberculosis. He made experiments on the infectivity of the nasal mucosa by tubercle and the method of its spread. Infected sputum was introduced into various parts of the nasal cavities of eight healthy guinea-pigs without injuring the mucosa, and after a varying period the animals were killed and examined. In seven cases there was evidence of tuberculous infection; the course of the disease was slow. In no case was there evidence of infection of the meninges, and there was no infection of the air-passages to the lungs. When the lungs were infected it was by means of the lymphatics, the first evidence of lymphatic infection being enlargement of the cervical glands, especially the superficial glands.

In 1898 A. Brown Kelly (13) described the development and clinical features of cysts of the floor of the nose. He made histological examination of the tissues in this situation, and pointed out the presence of long ducts from which the cysts probably originated.

Numerous investigations have been carried out by British authors with a view to elucidating the ætiology of nasal polypi; before considering these we may mention that Robertson (14) in 1805 published an account, together with a drawing of an instrument for snaring nasal polypi. Robertson's nasal snare was acknowledged by Wilde to be the instrument on which he modelled his aural snare; while later Hilton, unaware of the original purpose of the appliance, modified Wilde's instrument so that it might be used for the nose.

Although nasal polypi were known to Hippocrates, it was not till the middle of last century that their true nature was recognised by Frerichs (1843) and Billroth (1855). These authors pointed out that a nasal polypus was essentially a true hypertrophy of the nasal mucous membrane. In 1885 E. Woakes (15) suggested that they depended on disease of the underlying bone, which began with fibrosis, and went on to obliteration of the arteries and absorption and necrosis of bone. This process he called necrosing ethmoiditis. This paper received much adverse criticism, but in view of our present-day knowledge it was not so very far removed from the truth. In 1900 H. Lambert Lack elaborated this theory; he argued that a mucous polypus was a localised patch of cedematous mucous membrane resulting from periostitis and rarefying osteitis of the underlying bone. Lack examined sections of bone from thirty cases of nasal polypus, and found in every case changes of the nature of a rarefying osteitis. He believed that the changes in the bone were the primary cause of polypus formation. Eugene S. Yonge (17)

believed (1904) that polypi were œdematous hypertrophies of the nasal mucous membrane, the indirect result of certain mechanical changes in the glands, and he failed to find bony changes in most of the cases he examined. J. S. Fraser (18) also made investigations on this subject (1907). He came to the conclusion that nasal polypi were merely œdematous conditions of the submucous tissue due to chronic inflammation which was the result of severe or repeated attacks of acute rhinitis, and that the process gradually spread until the periosteum and bone became involved. He did not find bone disease in early cases, and did not believe it to be the primary cause of polypus formation.

Among other pieces of work involving much histological study. L. Hemington Pegler's (19) exhaustive paper on bleeding polypus of the septum, 1905, deserves mention. In this paper he collected sixteen cases of the disease. He suggested that their leading features could be best indicated by the term "discrete angioma of the septum."

We shall now refer to papers dealing with more purely clinical investigations, and in the first instance we shall deal with papers on hay-fever and asthma—subjects which have been much written about in this country.

The first detailed account of hay-fever was given by Bostock (20) in 1819, and in 1839 Elliotson (21) pointed to pollen as the probable cause of the affection. In 1873 Blackley, of Manchester (22), was the first to prove by experiment (on his own person) that the pollen of grasses and flowers was the cause of hay-fever. In 1902 Prof. Dunbar isolated a toxic substance from the pollen of certain grasses which could produce the symptoms of hay-fever in persons predisposed to the affection, and by immunising horses against this toxin he obtained an antitoxin which cut short the artificially produced attack. Sir Felix Semon (23) and P. McBride (24) in 1903 experimented with Dunbar's serum and confirmed his observations, but Semon found that clinically its value was rather limited, that though it afforded relief in some cases it did not do so in all; and that in some others, where it gave relief at first, it lost its effect after repeated use.

Though we shall refer later to papers on treatment, it is convenient to mention here certain methods of treating hay-fever introduced by British authors. The first to which we would wish to draw attention was suggested by Watson Williams (25), and consisted in spraying a solution of biniodide of mercury (1-10 to 1-20) into the nasal cavities. The second was proposed by Yonge (26). He advocated division of the nasal nerve, and obtained some very striking results, both in cases of hay-fever and in allied neuroses.

L. Noon (46), starting on the assumption which had been proved by Dunbar that pollen-toxin is a body capable of giving rise to the production of antibodies in animals and even in hay-fever subjects, undertook experiments to see what degree of immunity could be produced in hay-fever patients by inoculations of pollen-toxin. He found it possible to raise the patient's resistance to a marked degree. Extracts of pollen were made and the measure of the patient's resistance tested with various strengths; having found the patient's resistance, doses of pollen-extract were given subcutaneously. The author showed that suitable doses increased the immunity, while unsuitable doses either did not affect it or diminished it. His researches were continued by J. Freeman (47), who gave a record of twenty cases treated by pollen-vaccines. The results on the whole were very satisfactory. Full details were given in this paper of the methods of employment.

The relation of asthma to the upper air-passages was first pointed out by Voltolini in 1877 and again by Hack in 1882, but there are certain points, both in the diagnosis and the treatment of these cases, to which attention has been drawn by British authors.

P. McBride (27) has shown that in many asthmatics spots can be detected on the nasal mucosa which produce cough when touched, and he found that the application of the cautery to these spots produced improvement, and might bring about a practical cure. Greville Macdonald (28) pointed out that in many asthmatics there might be found œdema of the mucous membrane over the upper part of the triangular cartilage of the septum, and that cauterisation of the area gave excellent results, in some cases even when there was no œdema. It will therefore be seen that Macdonald's observations ante-date those of Francis by several years. Francis (29), in a communication to the London Clinical Society in 1902, claimed to have cured a large number of cases of asthma by repeated and light cauterisations of the septum. He regarded those cases as most favourable in which the nose was apparently normal.

We must now refer to an important monograph by Sir StClair Thomson (30), published in 1898, on the spontaneous escape of cerebro-spinal fluid from the nose. He was the first to recognise this condition. Besides giving a detailed account of his own case, he collected several cases from the literature bearing on this affection, and went fully into the differential diagnosis and into the clinical features of this rare condition.

Among other rare diseases first described by British authors we may mention enchondromata of the nose, examples of which were published by Erichsen (31) in 1864 and Bryant (32), two cases, in 1867. Morell Mackenzie (33) also recorded a case which he removed with a snare. After cutting through the base the tumour was found to be too large to be extracted, and he had to divide it in two pieces with the snare.

In 1900 A. Brown Kelly (34) pointed out that in profuse epistaxis from above the anterior end of the middle turbinate the source was probably the anterior ethmoidal vein; that this vein anastomosed with the veins of the dura mater and might even open into the superior longitudinal sinus; and that it possessed no valves to prevent a backward flow. These conditions would therefore allow of abundant hæmorrhage from the proximal end of a ruptured ethmoidal vein.

While on the subject of epistaxis, we may mention a communication (35) by G. Hunter Mackenzie in 1902. He succeeded in arresting hæmorrhage from the nose by stripping the whole of the mucous membrane from the septum with a nasal spoon and curette. In this case all the usual methods of treatment had proved unavailing, and although the hæmorrhage at the time of the operation was very sharp, it soon ceased spontaneously.

We may now turn to a valuable clinical paper by P. McBride on lupus and tuberculosis of the upper air-passages (1892). The author pointed out that lupus was not usually associated with obvious microscopic ulceration, but that the loss of tissue which occurred was due to a caving in of the nodular surface rather than to an external breaking down. He had, however, observed transition forms between tuberculosis and lupus, though they were very rare.

Previous to the eighteenth century a few isolated examples of maggots in the nose had been recorded. In 1830 Macgregor (37) published an example of the disease which he had observed in British India. In 1871 Lahory, a native practitioner (38), wrote an article on penash, and gave an account of its symptoms.

We shall finally consider papers which deal mainly with methods of treatment. In connection with paroxysmal rhinorrhœa, E. B. Waggett (39), in 1910, advocated the use of calcium lactate in the treatment of this condition. He was led to do so because of the frequent association of urticaria with rhinorrhœa, and Wright had shown that there was deficiency of lime-salts in the blood in urticaria. Waggett obtained good results by this method of treatment.

In 1906 W. Stuart Low introduced a new operation for nasal obstruction, which he termed "submucous turbinectomy." The method consisted in incising and dissecting up the soft parts from the underlying bone and then making a submucous resection of the bone. The method was applicable to either the inferior or the middle turbinals.

Since Gersuny published in 1900 five cases in which he had injected paraffin into various parts of the body for various defects, including one case of nasal deformity, the method has been practised by various authors and for various conditions. Walker Downie (41), Scanes Spicer (42) and Stephen Paget (43) used it in the correction of nasal deformities, and in 1903 Lake (44) had the ingenious idea of employing it to correct the roominess of the nasal chamber due to atrophy in cases of ozæna by injecting paraffin into the inferior turbinated body. Priority must be given to Lake, therefore, in connection with this method of treating ozæna.

In 1912 Duncan Forbes and H. P. Newsholme (45) contributed an interesting paper on "Membranous Rhinitis and its Treatment by Auto-genous Vaccine." Contrary to Lack's (11) experience they were able to show that in these cases there was a definite relation between membranous rhinitis and diphtheria. In the three cases in which they used a vaccine it seemed to be of definite value in removing membrane, getting rid of nasal discharge, and hence greatly reducing the infectivity of membranous rhinitis; but the vaccine did not appear to be capable of completing the work of elimination after the membrane had gone.

THE ACCESSORY NASAL SINUSES.

Persual of the literature dealing with the accessory sinuses of the nose reveals the fact that British investigators have taken no small part in extending our knowledge regarding these cavities. Since the early eighties increasing interest and activity have been displayed in this branch of surgery, and it is indeed correct to say that it is during the thirty-two years which have elapsed since the International Congress of Medicine met in London in 1881 that we have obtained most of our knowledge regarding the surgery of the accessory sinuses. The subject was not referred to either in discussion or paper at the meeting in 1881, and we find no mention of suppuration in the sinuses in Morell Mackenzie's classical text-book published in 1882.

Prior to this time it would appear that interest centred mainly in the surgery of the maxillary sinus, and it is interesting to note the part taken by British surgeons in this connection. As far back as the year 1651 Nathaniel Highmore described a case of suppuration in the antrum in the "*Corporis Humani Disquisitio Anatomica*," and apparently this was the first description of the condition. William Cowper, who wrote the article on diseases of the nose in Drake's "*Anthropologia Nova*," published in 1707, advocated the opening of the antrum through a tooth-socket. Priority must be given to Cowper, though it has been claimed for Meibomius. The latter, however, who died in 1655, never published his

cases, and it was not until 1718 that a description of the operation as performed by Meibomius was published by his son. In 1778 John Hunter (48) advocated the opening of the sinus through the middle meatus of the nose. Benjamin Gooch, in his "Medical and Chirurgical Observations," which formed an appendix to his "Cases and Practical Remarks in Surgery," second edition, 1797, relates a case in which he opened the antrum above the alveolus with a gimlet, thus anticipating the modern canine fossa procedure. It is evident, therefore, that the various recent surgical procedures upon the antrum, which have been so exhaustively described and modified, had found their pioneer exponents in this country.

Charles Bell, in his "System of Operative Surgery," second edition, 1814, used the trephine upon the anterior wall of the frontal sinus and insisted that no tents or dressings should be introduced into the cavity.

As a point of further historical interest, however, we must mention the elaborate investigations of Sir William Hamilton (49) into the anatomy of the frontal sinuses in 1845. When in the earlier years of the nineteenth century the doctrine of phrenology occupied so prominent a position both on the Continent and in Scotland, Hamilton was able to demonstrate that, owing to the presence of the frontal air-cavities between the two tables of the frontal bone, there could be no relation between the surface of the brain and the external surface of the calvaria. Consequently, in the region of the forehead at any rate, the ground-work of phrenology based on the contour of the cranium was weakened, if not destroyed.

The Anatomy of the Sinuses.—It is only natural that rhinologists should have turned their attention in the first instance to a study of the anatomy of this region, as a thorough knowledge of the many variations in the development of the accessory cavities is essential to a complete comprehension of the difficulties in diagnosis and treatment. While the anatomical investigations of Zuckerkandl first published in 1882 and again in 1893 must always remain the standard work upon the subject, the gradual growth of our clinical knowledge of suppuration in the sinuses and its extension from the cavities to the orbit and the intracranial structures has naturally led us into wider fields of anatomical investigation.

The frontal air-sinuses, partly owing to their many variations and in consequence of their increasing surgical interest, have been the object of considerable research. Herbert Tilley (50), in 1896, published the results of his examination of 120 skulls, and drew attention to some of the more important anatomical variations met with in these cavities, emphasising the bearing which they had upon surgical interference. As a result of his observations he advocated at that time the vertical mesial incision in operating upon a diseased frontal sinus. In 1898, Logan Turner (51), following up Vohsen and Kuhnt's observation that the frontal sinuses could be mapped out upon the forehead by placing a small electric lamp beneath the inner third of the supra-orbital margin, utilised this method for an extensive investigation of the frontal sinuses in 578 skulls.

The examination dealt with the presence and absence of the cavities, their size, their characteristics in relation to sex and race and the variations met with in the sinuses in the different types of skull. His final conclusions were published in 1901 (52), and briefly summarised they showed that in 578 skulls examined, one or both sinuses were absent in 157 or 27 per cent., that the right sinus was absent more frequently than the left; that the left sinus was more often the larger of the two;

that their absence was more often noted in female skulls, and that the average height and breadth of the sinuses was less in females than in males. It was further shown that the frontal air-sinuses in European and Asiatic crania were less frequently absent than in the aboriginal Australians, the Maoris, Tasmanians and Esquimaux. It was also found that the frontal cavities possessed no distinctive form or size which could be regarded as peculiar to any of the great skull types, dolichocephalic, mesaticephalic or brachycephalic.

In 1899 the Jacksonian Prize was awarded to Lambert Lack for his essay upon "The Pathology, Diagnosis and Treatment of the Inflammatory Affections of the Nose and its Accessory Sinuses and Air-cells." This comprehensive piece of work, containing a great deal of valuable information, was amplified and embodied in his text-book upon diseases of the nose published in 1906.

The anatomical variations in the maxillary sinus have received considerable attention from Brown Kelly (53) in his examination of one hundred cadavera. Amongst the various data collected by the writer we would draw special attention to his observations upon accessory antral openings. These were noted in 10 per cent. of the cases, and the majority occurred in subjects past middle life. Further, he was struck with the comparatively frequent association of these openings with cysts of the lining membrane of the antrum. He raised the question, therefore, as to the possible origin of the accessory ostia from a gradual thinning of the membranous wall between the antrum and the nasal cavity, the process at the same time favouring a cystic degeneration of the neighbouring antral lining membrane. Giraldès in 1860 had pointed out that the accessory opening is very often the result of pathological changes. It will not be out of place to refer here to Brown Kelly's (54) investigations upon naso-antral or choanal polypi (1909), the true origin of which was first described by Killian in 1906, because Kelly was able from his observations in these cases to still further develop the connection between the ostia accessoria and cyst formation in the antrum. In eleven cases of this condition, a large cyst occupied the antral cavity in seven, the lining membrane was polypoid in two, and in two others it was generally thickened. In ten there was one large ostium accessorium, and in the eleventh two of these openings existed. We thus have an association of antral cysts and ostia accessoria, two conditions necessary for the development of the naso-antral polypus.

Arthur S. Underwood (55) has studied the normal anatomy of the maxillary sinus, more particularly in connection with the teeth, and he has shown how the cavity is largely modified by the eruption and arrangement of the cheek teeth, both deciduous and permanent (1910). The alveolar portion of the sinus is morphologically dental, and the germs of the cheek teeth contained in bony crypts are in a sense within the cavity of the antrum. As the teeth erupt the antral floor with its dome-shaped elevations follows the teeth and becomes gradually concave, descending below the level of the nasal floor. Between the adjacent teeth, and consequent upon their descent, one or two thin bony ridges are formed more or less transverse in position, and varying in their vertical measurement. Occasionally one of these ridges develops in such a way as to form an almost complete vertical septum, subdividing the cavity of the sinus into an anterior and posterior compartment. As further evidence of the influence of the teeth upon the alveolar portion of the antrum is the fact that after they have been extracted or lost the sinus floor becomes thickened and raised, until

eventually in an edentulous jaw it lies on a level with or is even elevated above the floor of the nasal cavity.

The exhaustive investigations of Onodi upon the variations in the posterior ethmoidal and sphenoidal sinuses have rendered it difficult for other workers to contribute fresh anatomical data. W. S. Syme (56) has examined the sphenoidal sinuses in 240 crania. Amongst other facts he has drawn attention to the relation which the sphenoidal sinus may bear to the Vidian nerve and to Meckel's ganglion. When the cavity is large the Vidian nerve may lie in close contiguity to its floor, and in two instances he found the bony wall of its canal defective, and consequently in the recent condition the nerve would be in immediate contact with the lining membrane of the sinus. The association of this nerve with the tympanic plexus through the great superficial petrosal nerve may possibly supply an explanation of the occurrence of pain in the ear in some cases of sphenoidal sinus suppuration, a symptom to which attention was first drawn by Herbert Tilley (1905).

Charles A. Parker (57) in 1908 first described the presence of air-cells in the posterior part of the vomer, a condition which he had met with while carrying out the submucous resection operation. An examination of 500 skulls revealed the fact that they were formed by a prolongation of one or other of the sphenoidal sinuses, and sometimes of both of them. He designated the cell as the "spheno-vomerine bulla." It was found to occur in eleven instances or in 2 per cent. of the cases, it was bilateral in 27 per cent., and unilateral in 72 per cent. In several instances Parker found the rudiment of a similar cell in the perpendicular plate of the ethmoid bone.

Bacteriology and Pathology of Sinus Suppuration.—While the bacteriology of the normal nasal cavities had been investigated by von Besser, Paulsen, Straus and others prior to the work of StClair Thomson and Hewlett (58), these authors were the first in this country to carry out any extended research in this field (1895). They emphasised the distinction which must be drawn between the vestibule and the mucous cavity of the nose, because while the former swarmed with organisms and was never found sterile, the nasal cavity proper was frequently sterile (84 per cent. of the cultures), and in no case did any abundant growth of organisms take place. These investigations were repeated at a later date by C. J. Lewis and Logan Turner (1905) (59), and their results went to prove that the healthy nasal cavities were not so free from organisms as the researches of StClair Thomson and Hewlett had demonstrated. By inoculating sterile broth and incubating for twenty-four or forty-eight hours Lewis found that the interior of the nose was not nearly so sterile as it appeared to be when more rapid methods of investigation are employed. The organisms of the healthy nose belong to the same varieties as those found in abnormal conditions, but they differ from the flora of pathological nasal mucous membranes in being fewer in number, of greater purity of culture, less vigorous in growth and less pathogenic. In 1908 Allen (60) examined a series of healthy nasal cavities, and in no case did he find them sterile, and more recently (1912) Douglas Harmer (61) has investigated the bacteriology of the nose and throat with special relation to vaccine treatment.

Inquiry into the bacteriology of accessory sinus suppuration was merely a further and natural step in the investigation of the bacterial flora of the upper air-passages, and we find the names of E. Fränkel, Weichselbaum, Dmochowski, Herzfeld and Herman, Howard and Ingersoll, Stanculeanu and Baup associated with extensive research in this field.

One of the most complete investigations into the bacteriology of accessory sinus suppuration was that carried out by C. J. Lewis and Logan Turner (1905, 1910) (62). It is impossible to dwell in a detailed way with the many points dealt with by the writers. Four main types of cocci are commonly met with in sinus suppuration, viz. pneumococci, streptococci, staphylococci and diplococci of the type of *Micrococcus catarrhalis*, and while bacilli of various kinds are frequently found in the affected sinuses and may cause suppuration, the pyogenic cocci are more often the responsible agents. Considerable attention was paid to the question of the nasal and dental infection of the maxillary sinus by these writers. It was evident from a study of the literature of the time that opinions differed as to the commoner route of infection of this cavity. B. Fränkel, Lermoyez, Grünwald and Tilley favoured the dental route, while Zuckerkandl, Hartmann, Dmochowski, Hajek and G. L. Richards regarded nasal infection as the more common. While Lewis and Turner were able in some cases to isolate identical organisms from the sinus pus and from teeth extracted at the time of operation upon the antrum, their bacteriological and clinical investigations undoubtedly proved that nasal infection of the antrum was more common than dental, and that probably only about one third of the cases of maxillary sinus suppuration were due to infection from the teeth.

Possibly a recognition of the above point may have influenced to some extent at least our operative procedures upon the antrum, nevertheless the fact remains that the alveolar opening has been for the most part discarded, and the intra-nasal and canine fossa operations are those now usually practised. Although it may be stated that as a general rule the intra-nasal operation is selected for cases in which the suppuration is of more or less recent origin, while the canine fossa operation (Caldwell-Luc) is more suitable where a long-standing discharge has existed, there is considerable clinical evidence to prove that the duration of the discharge from the antrum is not the only factor which should guide us in the choice of operation. With the object of determining upon a scientific basis the best method of procedure in any given case, a cytological examination of the antral discharge was carried out by John M. Darling (1909) (63), and as a result of his work along with the observations of Lewis and Logan Turner, the following conclusions were arrived at, viz. that a knowledge of the organisms and of the kind of cells in antral discharge is of assistance in determining the operative procedure to be adopted. In cases of long-standing suppuration intra-nasal lavage may in the first instance be practised when the pneumococcus and staphylococci are the predominant organisms. When in the same class of case the *Streptococcus pyogenes* is the virulent organism, and when in association with it there is an excess of lymphocytes in the discharge, lavage need not be attempted, but a radical operation through the canine fossa should be carried out.

Pathology.—The examination of the accessory sinuses in the *post-mortem* room is a line of investigation which has been carried out by a number of observers, amongst whom may be mentioned E. Fränkel, Harke, Kiaer, Lapalle, Gradenigo, Wertheim, Minder, and Goetjes. It was demonstrated by these researches that sinus inflammation* was apparently present more frequently than clinical experience had led us to believe was the case, thus raising the suggestion that many cases were overlooked during life, the symptoms either being neglected by the patients or the true condition remaining unrecognised on nasal examination. On the other hand, it was possible that the cavities might have

become infected during the fatal illness. Without entering into a detailed analysis of the results obtained by different observers, it may be stated in general terms that while in certain fatal diseases accessory sinus inflammation is found after death, many of the cavities regarded as diseased on naked-eye examination are not in reality the seat of pathological changes. It is very necessary to make an histological examination of the lining membrane of the sinus before determining that the cavity is actually diseased. Amongst British workers in this line of investigation we find that Kirkland and Stacy (Australia) (64) in 1902 examined the cranial sinuses in one hundred cadavera. Pneumonia accounted for twenty-two of the deaths, and in eleven of these one or more of the sinuses were involved—that is, 50 per cent. In thirteen of the remaining subjects there was evidence of pus in the sinuses, but in none of the cases in the whole series was any histological examination made.

Brown Kelly, in 1904 (65), detailed the results of his examination of the maxillary sinus in one hundred cadavera, and found pus in nineteen instances, but in five of these cases the lining membrane of the cavity presented a normal appearance, thus showing that after death pus may be found within a sinus without any other pathological change. The same writer dealt at some length with the relation of the fatal disease to the *post-mortem* condition of the antra, and, like E. Fränkel, Wertheim, Lapalle, Minder and Kirkland, he showed that in cases dying of pneumonia the antra may be the seat of suppuration (50 per cent. of the cases examined). It is interesting further to note that in cases of cardiac disease he found serous fluid present in 39 per cent.

In 1910 J. D. Comrie and J. S. Fraser (66) undertook a similar line of investigation in connection with the sphenoidal sinuses in fifty cadavera. They found that, while in 32 per cent. of the cases a naked-eye inspection of the cavities showed abnormal conditions, microscopic examination revealed the presence of marked inflammatory changes in only 6 per cent. Slight catarrhal changes, however, were more frequent, being noted in seventeen cases.

Following up the work of Oppikofer and Goetjes upon the histological changes in the mucous membrane met with in sinus suppuration, J. S. Fraser (1909) (67) has described and illustrated his investigations. The writer brings forward microscopical evidence to show that the changes which occur in the mucous membrane of the accessory sinuses in simple acute and chronic inflammatory conditions are of a similar nature to those which take place in the nasal cavities in catarrhal and suppurative rhinitis, and analogous also to those which occur in the middle-ear cleft in catarrhal and suppurative otitis media. The chronic inflammatory œdema or serous exudation in the connective-tissue spaces in a nasal polypus is repeated in the submucous tissue of a sinus affected with catarrhal inflammation. Again the microscopical changes in the nasal mucous membrane of the ozæna patient—the squamous metaplasia, the atrophied glands and the leucocytic infiltration—find their counterpart in the antral mucosa of a chronic suppuration. The analogy may be carried to the middle-ear cleft, where, both histologically and clinically, similar conditions were found.

In connection with the pathology of the maxillary sinus, mention must be made of Brown Kelly's (68) contribution to the literature of acute osteomyelitis of the superior maxilla in infants. Various authors had previously published cases of an acute inflammatory condition under the designation of empyema of the antrum in infants. Kelly in 1904 reviewed all the literature upon the subject, and confirmed the view

previously advanced by Schmiegelow that the symptoms in these cases were due to an acute osteomyelitis, and he further expressed the opinion that it was primarily an acute inflammation of the dental sac of the first molar tooth spreading thence to the upper jaw-bone.

The relation of pathological conditions of the sinuses to the orbit and its contents on the one hand and to the cranial cavity on the other has received considerable attention from rhinologists and ophthalmologists in this country, and many valuable cases have been put on record. The co-operation of workers in both these departments of surgery has led to a more thorough investigation of these conditions and to their treatment upon more scientific lines. Cases of "mucocele" of the sinuses have been described by Hulke, Silcock, Jessop, Cresswell Baber, Lambert Lack and others, and probably the most complete account of this condition has been given by Logan Turner (1903 and 1907) (69). In the majority of cases the distension of the sinus is accompanied by displacement of the globe of the eye, but there are a few interesting records in English literature of optic neuritis associated with this form of accessory sinus disease. Fullerton (1910) (70) has described a case of ethmoidal mucocele with optic neuritis, while G. H. Pooley and George Wilkinson (71) (1913) have recorded a very rare example of temporary total blindness in one eye due to pressure on the optic nerve from cystic distension of the left maxillary sinus.

The increasing interest in the association of sinus disease with orbital and ocular changes is evidenced by the numerous papers and reported cases dealing with the subject. G. F. C. Wallis (72) has contributed several articles dealing with this class of case. The intracranial complications of sphenoidal sinus suppuration have been very fully discussed by Sir StClair Thomson (1906) (73) in an analysis of forty-two cases, in which we find meningitis and cavernous sinus thrombosis occurring with almost equal frequency as a complication of sphenoidal sinus suppuration.

Diagnosis.—Since Ziem's important observation, published in 1886, drawing attention to the fact that a discharge of pus from the nose might have its origin in the antrum without any of those classical signs previously recognised as symptomatic of antral suppuration, the diagnosis of this condition has been considerably elaborated. Further, we may add that as a result of Ziem's paper attention was naturally directed to the diagnosis of chronic suppuration in the other accessory sinuses. Although the chief advances have been made by Continental workers, especially in Germany, more than one point has been elucidated by rhinologists in this country. The employment of electric transillumination of the antrum suggested by Voltolini and perfected by Heryng in 1889 furnished us with a valuable aid in the diagnosis of antral suppuration. In 1892 Brown Kelly (74) first employed the subjective light sensation during transillumination of the antrum as an additional diagnostic test. He noticed that if an individual under examination closed his eyes when the lamp was in his mouth, he might be conscious of the perception of a red glow in each eye; in almost all the cases in which the antral crescent of light was absent on one side of the face—whether from the presence of pus in the antrum or from other causes—the patient stated that he recognised a subjective light sensation on the bright side, but failed to detect the same in the eye upon the dark side. The patient in this way is able to supply additional corroborative evidence of antral disease. In a later paper (1904) Kelly dealt at considerable length with the value of the diagnostic illumination test, and the way in

which age and the form of the palate influenced it. In connection with the diagnosis of ethmoidal disease Robertson (1892) attempted to utilise illumination, but it has not proved to be reliable. Logan Turner (1898) (51) investigated the value of transillumination in chronic frontal sinus suppuration, and showed that it was not a reliable diagnostic method.

With the introduction of the X rays a further means of diagnosis was placed in our hands. While their application to sinus work was introduced by Scheier in 1897, John Macintyre (75) was the first rhinologist in this country to demonstrate their utility in the diagnosis of sinus disease (1900), and in some cases he found them of undoubted value where other methods had failed. At the present time it may be said that skiagraphy has come to be regarded as a routine method of examination in all cases in which any difficulty exists in regard to the diagnosis. This is evident from a perusal of the various text-books and society proceedings dealing with diseases of the nasal cavities. Logan Turner and W. G. Porter, in their "Atlas of Skiagraphy" (1912), have drawn attention to the value of the X rays from the anatomical as well as from the clinical standpoint, and they were the first to illustrate the diagnostic value of the rays in the cases of naso-antral polypus and the position of the dental cyst in connection with the cavity of the antrum. They also showed the appearances presented by the skiagram of the mucocele.

One of the most valuable aids in the diagnosis of maxillary sinus suppuration is that known as the posture test, the clinical significance of which is usually attributed to B. Fränkel (1888). Credit must, however, be given to Spencer Watson (76), because we find in his text-book on diseases of the nose, published in 1875, the following interesting statement. After referring to a case published by Trousseau, in which the patient was able to demonstrate the existence of a foul-smelling discharge from his nose by holding his head down, Spencer Watson writes, "the position of the head during the discharge of pus, when this is capable of control (as in the case of Trousseau's patient), is a very conclusive evidence of the seat of the disease. It is not, however, an invariable, or even common symptom, though, when present, it is one of great value."

The question as to whether we are dealing with primary suppuration in the antrum or merely with its infection from one of the sinuses situated above it, has received a good deal of attention in recent years, and Greville Macdonald (77) in 1890 was the first to refer to this point. "It must be remembered," he writes, "that the frontal sinus and the anterior ethmoidal cells also open into this region (the middle meatus). . . . It is more than probable that, in the event of pus being formed in the anterior ethmoidal cells the antrum will prove to be a reservoir, even if itself not directly involved in the disease." He goes on to state, on the authority of the late Dr. Curnow, at that time Professor of Anatomy in King's College, that occasionally direct communication exists between both the anterior and posterior ethmoidal cells and the summit of the antrum, and, further, that owing to the partition between the infundibulum and antrum being thinned or actually defective, the contents of the frontal sinus may flow into the antrum. In the same publication Greville Macdonald gives a correct explanation of the condition which had been previously described by E. Woakes as "cleavage of the middle turbinated" occurring in the disease, which that author had named necrosing ethmoiditis. Macdonald points out that the swelling is inflammatory and is attached immediately below the *ostium maxillare*, and is not a part of the middle turbinated bone. Although he observed this inflammatory swelling in cases of antral suppuration, he points out that it was present in four instances in which

there was no pus in the antrum. In the same year (1890) Kaufmann published his description of the "lateral swelling," that is to say, the identical condition referred to by Macdonald. Kaufmann regarded it as pathognomonic of maxillary sinus disease, a contention which has since proved to be no longer tenable. We have referred to these points here in order that priority may be given to Greville Macdonald, not only for the explanation of the appearance designated as cleavage of the middle turbinated, but because he adumbrated what has since been duly recognised, namely, that the "lateral swelling" may be present without antral disease, and is not pathognomonic of that condition.

In connection with the diagnosis of sinus suppuration, we wish to refer to three further clinical points to which attention has been drawn. It was pointed out by McBride (1888) (78) that in some cases of chronic antral suppuration there was a marked redness of the mucous membrane of the gum upon the affected side. His attention was directed to this clinical phenomenon by J. M. Cotterill. Brady (Sydney) (79) in 1899 published a series of cases of antral suppuration in which he pointed out that the diagnosis was arrived at by observing on posterior rhinoscopy a thin streak of pus below the posterior end of the middle turbinated body. Examination of the middle meatus on anterior rhinoscopy both before and after posturing the patient was always negative. Finally, in discussing the symptoms of sphenoidal sinus suppuration, Tilley (1905) (80) noted in two cases the occurrence of severe attacks of earache which were relieved by a discharge passing into the throat. Complete cessation of these attacks followed upon the treatment of the affected sphenoidal sinus.

While the above facts represent the more important points to which attention has been drawn by rhinologists in this country, they do not deal with a great deal of valuable clinical work which has been written on sinus suppuration. Space, however, prevents us from doing more than merely mentioning the contributions to the subject by Semon, McBride, Lambert Lack, Milligan, Tilley, StClair Thomson, Watson Williams, Walker Downie, Chichele Nourse and Donelan.

Treatment.—*Pari passu* with the advance in our knowledge of the aetiology and pathology of sinus disease there has naturally been an improvement in the general planning of our operations, and many minor modifications in their technique have from time to time been devised. In connection with the maxillary sinus we have to note that the canine fossa operation of Desault and Küster in which the subsequent after-treatment of the cavity was carried out through the canine opening has been practically discarded. The addition of a large counter-opening in the nasal wall of the antrum has greatly facilitated not only the after-treatment of these cases but rendered their cure much more certain. In 1894 Scames-Spicer (81) advocated and practised this procedure. Unknown to Spicer an operation on similar lines had been described by Caldwell of New York in 1893, and in 1897 Luc of Paris published independently his description of the same procedure generally known to-day under the term of the Caldwell-Luc operation.

For a number of years the method of dealing with the frontal sinus, which was first advocated by Ogston (82) in 1884 and independently described by Luc in 1896, was a favourite procedure in cases of chronic suppuration in that cavity. The great tendency for these cases to relapse, and a not infrequent post-operative mortality, have gradually led surgeons to give up the Ogston-Luc operation. With the introduction of the Killian method in 1895, whereby a more thorough radical treatment of the disease both in the frontal sinus and in the ethmoidal cells was

rendered possible, relapses were not only less frequent, but post-operative fatalities, though not unknown, no longer bulked so prominently. Variations in the frontal sinus operation have been described in this country by Tilley (83) and Watson-Williams (84). The former has modified Killian's operation in so far as he does not remove the whole of the floor of the sinus, contenting himself by taking away only the inner portion of it so that he is able to obtain free access to the ethmoidal cells. Watson-Williams has adopted an osteo-plastic method with the object of minimising the disfigurement which may follow operative procedures in this region. The bone-flap, which is temporarily turned outwards in this case, consists of the nasal bone and the ascending process of the superior maxilla. When the ethmoidal region has been thoroughly dealt with, the osteo-plastic flap is replaced, and, if necessary, held in position by buried wire suture.

The application of vaccines to the treatment of accessory sinus suppuration as a substitute for operation has been given a fair trial in this country, but the results have not proved sufficiently satisfactory to warrant their employment as a routine line of treatment. E. B. Waggett (1909) (85) has carefully considered the subject and placed the results of his own observations before the profession, while Goadby, Watson-Williams, Allen and Birkett (Montreal) (86) have also contributed their experience on this line of therapy. The employment of vaccines, on the other hand, as a post-operative measure to assist in the clearing up of residual discharge has undoubtedly been shown to be of service.

BIBLIOGRAPHY.

- (1) *Brit. Med. Journ.*, October 15, 1910. (2) *Journ. of Laryngol., Rhinol., and Otol.*, January, 1907. (3) *Ibid.*, February, 1913. (4) *Brit. Med. Journ.*, 1888, p. 1210. (5) *Agenda Scottish Otological and Rhinological Society*, May, 1913. (6) *Journ. of Laryngol., Rhinol., and Otol.*, July, 1901. (7) *St. Bart's Hosp. Rep.*, 1893. (8) *Journ. of Laryngol., Rhinol., and Otol.*, June, 1911. (9) *Lancet*, 1868, vol. ii, p. 243. (10) "Diseases of the Throat and Nose," vol. ii, p. 390, 1884. (11) *Med.-Chir. Trans.*, vol. lxxxii, 1899. (12) *Journ. of Path. and Bact.*, February, 1901. (13) *Journ. of Laryngol., Rhinol., and Otol.*, June, 1898. (14) *Edin. Med. and Surg. Journ.*, 1805, vol. i, p. 410. (15) *Brit. Med. Journ.*, 1885, vol. i, p. 710. (16) *Journ. of Laryngol., Rhinol., and Otol.*, February, 1901. (17) *Ibid.*, April, 1904; see also "Polypus of the Nose," 1906. (18) *Scottish Med. and Surg. Journ.*, April, 1907. (19) *Lancet*, November 18 and 25, 1905. (20) *Med.-Chir. Trans.*, vol. x, 1819. (21) "Lectures on the Theory and Practice of Medicine," London, 1839. (22) "Hay-Fever," London, 1873. (23) *Brit. Med. Journ.*, 1903, vol. i, pp. 713, 910, vol. ii, p. 123. (24) *Edin. Med. Journ.*, 1903, vol. xiv, new series. (25) "Rhino-logy: A Text-Book of Diseases of the Nose," 1910. (26) "Diseases of the Nose and Throat," 1909, p. 101. (27) *Edin. Med. Journ.*, July, 1899. (28) "Hay-Fever and Asthma," 1892. (29) *Trans. Clin. Soc., London*, 1902. (30) "The Cerebro-spinal Fluid: Its Spontaneous Escape from the Nose," 1898. (31) *Lancet*, 1864, vol. ii, p. 152. (32) *Ibid.*, 1867, vol. ii, p. 225. (33) "Diseases of the Throat and Nose," 1884, vol. ii, p. 386. (34) *Lancet*, February 24, 1900. (35) *Ibid.*, May 10, 1902. (36) *Edin. Med. Journ.*, August, 1892. (37) Quoted from Morell Mackenzie, *loc. cit.*, p. 449. (38) *Ind. Med. Gaz.*, 1871. (39) *Brit. Med. Journ.*, 1910, p. 1710. (40) *Clin. Journ.*, October 17, 1905. (41) *Brit. Med. Journ.*, May 5 and November 8, 1902. (42) *Clin. Journ.*, April 9, 1902. (43) *Brit. Med. Journ.*, January 3, 1903. (44) *Lancet*, January 17, 1903. (45) *Ibid.*, February 3, 1912. (46) *Ibid.*, June 10, 1911. (47) *Ibid.*, September 13, 1911.

Accessory Sinuses.

- (48) "Practical Treatise on Diseases of the Teeth," 1778. (49) *Med. Times and Gaz.*, London, 1845. (50) *Lancet*, September 26, 1896. (51) *Edin. Med. Journ.*, 1898. (52) "The Accessory Sinuses of the Nose," Edinburgh, 1901. (53) *Glas.*

Med. Journ., 1904. (54) *Lancet*, January 9, 1909. (55) *Journ. of Anat. and Physiol.*, 1910. (56) *Journ. of Laryngol., Rhinol., and Otol.*, London, 1910. (57) *Brit. Med. Journ.*, September, 1908. (58) *Med.-Chir. Trans.*, vol. lxxviii. 1895. (59) *Edin. Med. Journ.*, 1905. (60) *Brit. Med. Journ.*, 1908. (61) "Practitioner's Encyclopædia," 1912. (62) *Edin. Med. Journ.*, 1905 and 1910. (63) *Ibid.*, December, 1909. (64) *Journ. of Laryngol., Rhinol., and Otol.*, London, 1902. (65) *Glas. Med. Journ.*, 1904. (66) *Edin. Med. Journ.*, 1910. (67) *Journ. of Laryngol., Rhinol. and Otol.*, London, 1909. (68) *Edin. Med. Journ.*, 1904. (69) *Ibid.*, 1903 and 1907. (70) *Brit. Med. Journ.*, April, 1910. (71) *The Ophthalmic Review*, May, 1913. (72) *Journ. of Laryngol., Rhinol., and Otol.*, London, May and October, 1911. (73) *Brit. Med. Journ.*, September 1906. (74) *Glas. Med. Journ.*, 1892. (75) *British Laryngol. and Otol. Assoc.*, 1900. (76) "Diseases of the Nose," London, 1875. (77) "Diseases of the Nose," London, 1890. (78) *Trans. Edin. Med.-Chir. Soc.*, 1888. (79) *Journ. of Laryngol., Rhinol., and Otol.*, London, 1899. (80) *Brit. Med. Journ.*, November, 1905. (81) *Ibid.*, December 15, 1894. (82) *Manchester Med. Chron.*, 1884-85. (83) "Diseases of the Throat and Nose," second edition. (84) "Rhino-logy: A Text-Book of Diseases of the Nose," 1910. (85) *Trans. Internat. Rhino-Laryngol. Congress*, Vienna, 1909. (86) *The Laryngoscope*, St. Louis, 1911.

THE OTO-LARYNGOLOGICAL SOCIETIES OF GREAT BRITAIN AND IRELAND.

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THERE can be no doubt that the tendency to the formation of societies devoted to special departments of the healing art did not develop with such rapidity in this country as in others that could be mentioned. Whether this was because of want of interest in the cultivation of those limited branches, or, on the other hand, because it was thought desirable to discuss special subjects in the arena of general societies, and so avoid the undue development of narrow specialism, is difficult to say. There has always, however, been considerable activity displayed and much good work carried out in the special sections at the annual meeting of the British Medical Association, and it was at the meeting in Dublin in 1887 that Dr. McNeil Whistler, who presided, suggested the desirability of the formation of a special society, meeting several times in the year.

THE BRITISH LARYNGOLOGICAL AND RHINOLOGICAL ASSOCIATION.

In any case the first society for the study of laryngology and rhinology in this country was started in 1888, mainly under the aegis of Sir Morell Mackenzie, with the title of "The British Laryngological and Rhinological Association." A history of this Society is detailed at some length in the *JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOL.*, vol. xxii, 1907, p. 318, but the following are a few of the salient features:

Among the more active inaugurators were Sir Morell Mackenzie, Dr. Woakes, Mr. Lemox Browne, Sir Philip Smyly, Mr. Kendall Franks, Dr. McNeil Whistler, Dr. Richard Hayes, and the first officers elected were—President, Sir Morell Mackenzie; Vice-presidents, Mr. Lemox Browne, Dr. Hunter Mackenzie, Sir Philip Smyly; Council, Drs. Whiphram, Woakes, Baber, Macintyre, with Dr. Richard Hayes and Mr. George Stoker as Secretaries.

After the first regular meeting several changes took place in the

personnel, a certain number of members resigning while fresh applications were made for election, and it may be noted that some of those who at that time thought fit to withdraw found it agreeable at a later period to rejoin and to prove themselves valuable and enthusiastic members.

The list of presidents in order from 1888 to 1907 is as follows :

Sir Morell Mackenzie (London)	1888-1889
Sir Philip Smyly (Dublin)	1889-1890
Dr. Hunter Mackenzie (Edinburgh)	1890-1891
Mr. Lennox Browne (London)	1891-1892
Dr. Sandford (Cork)	1892-1893
Dr. Macintyre (Glasgow)	1893-1894
Dr. McNeil Whistler (London)	1894-1895
Dr. George Stoker (London)	1895-1896
Dr. William Milligan (Manchester)	1896-1897
Dr. Dundas Grant (London)	1897-1898
Dr. Middlemass Hunt (Liverpool)	1898-1899
Dr. Barclay Baron (Bristol)	1899-1900
Mr. Mayo Collier (London)	1900-1901
Dr. Macintyre (Glasgow)	1901-1902
Dr. Wyatt Wingrave (London)	1902-1903
Mr. John Bark (Liverpool)	1903-1904
Mr. Chichele Nourse (London)	1904-1905
Dr. (now Sir Robert) Woods (Dublin)	1905-1906
"	1906-1907

It will be seen that the chair was not confined to London representatives, but that Scotland, extra-metropolitan England and Ireland contributed occupiers in good proportion and with every advantage to all concerned.

The programmes took to a large extent the form of papers and discussions with the exhibition of a few illustrative and even exceptional cases, but in later years the clinical element developed much more largely and led to many interesting extempore discussions. It was felt, however, that in the interests of accuracy and exhaustiveness the custom of having pre-arranged papers and discussions was of considerable value and called for considerable recognition in the work of the Association. During the session 1894-1895 a change was made in the constitution of the Society, after which otology was included in its scope and its title was altered to "The British Laryngological, Rhinological and Otological Association," as which it enjoyed an active existence until the great amalgamation in 1907.

THE LARYNGOLOGICAL SOCIETY OF LONDON.

A number of prominent laryngologists finding that, advantageous as it was for cases in their special department to be brought before the general clinical societies, there was room for another society for the demonstration, study and discussion of such cases, the "Laryngological Society of London" was initiated in the year 1893. Its inauguration and a great deal of its remarkable success were the results of the activity, energy and scientific enthusiasm of Dr. (now Sir) Felix Semon. In the programmes of this Society the main idea was the clinical one, and the display of cases from month to month is probably the most remarkable ever known in the history of laryngological societies. As an exception a meeting was occasionally devoted to a set discussion on important questions, such as, "The choice of the anæsthetic in operations for removal of post-nasal adenoid growths," "Diagnosis and treatment of empyema of the antrum

of Highmore," "Foreign bodies in the upper air- and food-passages," "Turbinectomy," "Asthma in relation to diseases of the upper air-passages," "Treatment of nasal polypus," "Malignant disease of the œsophagus," "The after-treatment of intra-nasal operations."

The first president was the veteran physician, Sir George Johnson, whose early work in laryngology was characterised by a brilliance only eclipsed by his work in connection with disease of the kidneys. The vice-presidents were Sir Felix Semon, Dr. McBride, Dr. McNeil Whistler; treasurer, Mr. Butlin; librarian, Dr. de Havilland Hall; secretaries, Dr. Clifford Beale, Dr. Scanes Spicer; Council, Mr. Cresswell Baber, Dr. Bronner, Dr. Dundas Grant, Mr. Mark Hovell, Mr. Charters Symonds. Sir George Johnson's successors in the presidential chair were as follows:

Sir Felix Semon (London)	1894-1896
Mr. Trentham Butlin (London)	1897-1898
Dr. de Havilland Hall (London)	1899-1900
Mr. Cresswell Baber (London)	1901-1902
Dr. McBride (Edinburgh)	1903-1904
Mr. Charters Symonds (London)	1904-1906
Dr. Ball (London)	1906-1907

Although the title of the Society suggested a limitation to London, it will be seen that the principal officers were to a great extent dwellers in other parts of the United Kingdom. One of the characteristics of this Society was that general surgeons and physicians who had shown special interest in laryngology were welcomed as members and elected to the highest offices, and in this way an undue tendency to exclusive specialism was avoided, and cases were discussed from the point of view, not merely of the laryngoscopic appearances, but of the relationships that surgical and medical disease held in each. We were thus often enabled to "see ourselves as others see us," and it may be truly said that the results were invariably instructive and occasionally chastening. There is every reason to believe that the proceedings of this Society have always been studied by specialists in other countries, and have been regarded as representative of much that was characteristic of the British mental attitude towards the healing art, namely, a keen perception of what was of most practical value accompanied by a certain amount of impatience of mere academic minutiae. From the most senior down to the youngest member of this Society, there is not one who has failed to derive educational advantage from it.

THE OTOLOGICAL SOCIETY OF THE UNITED KINGDOM.

The *Otological Society of the United Kingdom* was started during the wave of healthy enthusiasm which followed the meeting of the International Otological Congress in London in the year 1899, and it is probable that Mr. Arthur Cheatle had a larger share in bringing about its formation than any of the others who started and co-operated in the work. The first president was Sir William Dalby, who was then recognised as the *doyen* of Otological London, although he had preferred not to identify himself with the International Congress over which Professor Urban Pritchard had presided with such acceptance. The list of the first officers and council contained the names of Sir William Dalby (President); Prof. Urban Pritchard, Dr. Thomas Barr, Mr. George Field (Vice-Presidents); Mr. Cumberbatch (Hon. Treas.); Mr. Cresswell Baber (Hon. Librarian); Mr. C. A. Ballance, Mr. Arthur Cheatle (Hon. Secs.); Mr.

The list of original members included the more prominent officers of special as well as the general hospitals, more particularly those who had charge of the special departments at those hospitals. The rules for admission were from the commencement strict, so that it was scarcely possible for anyone to be admitted to the membership who was not actually an active contributor to otology; the subjects chosen for illustration and discussion were, therefore, as a rule, such as called for the "higher" criticism, and the debates were characterised as a rule by a more severe tone than was customary in the societies to which we have already referred. Many of the finer and more obscure questions (it must be admitted mainly concerning the dangerous sequelæ of ear disease) reached a very high level. The meetings were few in number, the programmes were very carefully drawn up, while the transactions were edited with scrupulous care, so that they constitute very valuable additions to otological literature. The presidents were, in order:

Sir William Dalby (London)	1899-1900
	1900-1901
Prof. Urban Pritchard (London)	1901-1902
	1902-1903
Dr. Thomas Barr (Glasgow)	1903-1904
	1904-1905
Mr. Cumberbatch (London)	1905-1906
" " "	1906-1907

In the year 1907 it was decided to form an amalgamation of as nearly as possible all the various medical societies in the centre and to incorporate with them those of a purely special character as well. The "British Laryngological, Rhinological and Otological Association," the "Laryngological Society of London," and the "Otological Society of the United Kingdom," studying what was believed to be the general good, agreed to give up their identity and to merge themselves in the great scheme, forming in the Royal Society of Medicine the Section of Laryngology and the Section of Otology, to which all the members of the three previously existing special societies were eligible for admission without ballot. On the whole, the change has been for the better, though some of the older members of the joining societies felt that there was some loss of autonomy, however slight, and some detriment to the intimacy of the fraternity which had previously existed. The rule that all fellows of the Royal Society of Medicine are permitted to attend the meetings of the special sections and to take part in the discussions, has, up to the present, been productive of nothing but good, and probably this will be the increasing effect. The presidents of both sections have been highly representative of the various localities and schools, namely :

Dr. Ball (London)	1907-1908
Dr. Dundas Grant (London)	1908-1909
" " " "	1909-1910
Dr. Watson-Williams (Bristol)	1910-1911
Sir StClair Thomson (London)	1911-1912
Dr. Herbert Tillet (London)	1912-1913

Otological Section.

Dr. McBride (Edinburgh)	1907-1908
Dr. Edward Law (London)	1908-1909
Mr. Arthur Cheate (London)	1909-1910
Dr. Milligan (Manchester)	1910-1911
Dr. Dundas Grant (London)	1911-1912
	1912-1913

We believe that the publicity of the sections has tended to raise the specialties in the respect of those from outside who have attended their meetings and made themselves acquainted with the quality of the work.

A reference has been made to the rules for admission to those sections, the preservation of which was insisted upon by the contracting societies when they entered into the amalgamation. It has been felt that their stringency might advantageously be relaxed so as to facilitate the admission to their membership of those whose interests in the special subjects were active, but who had not yet had time to attain to high professional eminence as such, or to have been appointed to the officership of special clinics, or even to have contributed seriously towards the progress of otology or laryngology. It is to be hoped that, for the benefit of all concerned, mere pretenders will still be ineligible for admission, but that evidence, however small, of a genuine desire to acquire expertness in the practice of these specialties, and a scientific knowledge of them, may open the portals to all deserving candidates.

THE SCOTTISH OTO-LARYNGOLOGICAL SOCIETY.

During the years of the co-existence of the societies of laryngology, rhinology and otology holding their meetings in London, endeavours were made so to time the meetings as to meet the reasonable requirements of members from extra-metropolitan portions of England and from Scotland respectively, as regards railway and other facilities, but in spite of the referenda on the subjects in which the voting was left chiefly to non-metropolitans, it was never possible to arrive at a completely satisfactory arrangement. Therefore, many, especially those from Scotland and the North, were unable to attend the meetings as often as they could wish, and, as a not unnatural result, the Scottish Oto-laryngological Society was formed, and has continued to enjoy a healthy and active existence, which has every prospect of continuing. The transactions, which appear regularly in this JOURNAL, are full of practical interest. Many of the members have continued their connection with the societies meeting in London, and frequently bring before them communications of the utmost value.

THE BRITISH OTO-LARYNGOLOGICAL SOCIETY.

In order to meet the requirements of those to whom the rules for admission to these established societies seem prohibitive, another has recently been formed under the title of the "British Oto-Laryngological Society." It is apparently conducted on such unconventional lines as to dispense with presidents. If it renders it any the easier for honest aspirants to make contributions of value to laryngology or otology, and to become eligible for admission to the membership of the bodies above mentioned, it will have rendered useful service. The treasurer is Dr Percy Jakins.

BRITISH EAR AND THROAT CLINICS HISTORICALLY CONSIDERED.

By RICHARD KERSHAW,

Secretary-Superintendent, Central London Throat and Ear Hospital.

"WITH every increase in the world's stock of gold, the metal loses something of its value, while every addition to the world's store of scientific truth adds to the value it already had, and is a stepping-stone to the acquisition of more." Thus spoke Sir William Jenner at the opening of the Seventh International Medical Congress held in London in 1881. With the advent of the Seventeenth Congress, which, after a period of thirty-three years, meets again in London, it seems an appropriate occasion to give some account of the method of action, and the result arising from that action, in regard to the provision which has been made in this country for the study and the relief of disease of the throat, nose and ear.

In this retrospect no excursion will be made into the fascinating history of antiquity, nor even into that of the far distant days when the sick were treated and housed in monastic or secular institutions, and when medical treatment was closely supervised by the priests, but it will be confined mainly to the rise and progress of otology and laryngology in modern medical institutions for which we have our own accurate records. The story which we have to tell dates from the beginning of the nineteenth century, at which time we find that there were special hospitals in this country for the treatment of eye and ear disease. The constructive period of hospitals, as we know them to-day, can hardly be said to have commenced until the middle of the century, whence began an era so full of creative conception and brilliant medical achievement, that long before the close of the century there was witnessed an entire transformation in the hospital world, and in every agency which had for its object the relief of the sick.

If a dip be made into institutional literature it will be found that in the year 1800 there were in Great Britain 154 hospitals and dispensaries supported entirely by voluntary contributions: 31 of these institutions were situated in London and in a very limited area; 68 were in the largest towns of the provinces; 41 were in Ireland; 14 were in Scotland.

In this list are included sixteen dispensaries (for out-patients) situated in London and thirty-six in the provinces. Some of these dispensaries found it necessary to enlarge the scope of their work, and this was carried out to such an extent that in the course of time and of financial affluence they developed into large general hospitals. At that time the special hospitals, which are still with us, and included in the foregoing list, were represented in London by four lying-in hospitals, two for the mentally afflicted, one for smallpox, and one lock hospital. Here and there in the provinces and in Ireland were to be found special institutions for the treatment of eye and ear disease, whilst the lying-in hospitals were for the most part attached to, or under the control of, religious communities. Many charitable agencies were also in existence to provide for the spiritual and educational welfare of the blind, and the deaf and dumb.

Behind us lies a century of hospital work; where do we now stand? Long before the dawn of the twentieth century we find that our previous list of medical institutions had increased from 154 in 1800 to over 1100

in 1900. Moreover, in this number are *not* included the hundreds of cottage hospitals which are now to be found in the outlying districts of our large cities and towns, neither has any account been taken of the numerous public and provident dispensaries—such important links of the hospital system—abounding in all parts for the treatment of out-patients.

In the first half of the century, that is from 1800 to 1850, 293 hospitals were founded, 46 of them being purely special hospitals, while in the last half of the century over 800 came into existence, 123 being special hospitals. The greatest and most noticeable increase took place in the decade of 1870–1880, when 166 hospitals were founded, 30 of them being special, of which 11 were for the treatment of the eye, ear, and throat.

It may well be asked what influence created this outburst of medical activity? It cannot be doubted that the most powerful of all factors, leading to hospital extension, was the vigorous growth of specialism brought about by the natural division of labour, as necessary in the practice of medicine as in the industry of commerce. When alluding to specialism in relation to medicine, Sir James Paget remarked, in his inaugural address at the Seventh International Medical Congress: "It cannot be said that in any of our sections there is not enough for a full strong mind to do. If anyone will doubt this, let him try his own strength in the discussion of several of them."

The institutions in which we are naturally most interested are those having for their object the study and the treatment of diseases of the throat, nose and ear, and we give a list of them in chronological order together with the names of the founders.

We do this for the purpose of showing the persistent enterprise of our predecessors, and to remind ourselves of those pioneers to whose zeal we owe so much and whose memory we delight to honour. It must not be forgotten that these men laboured under difficulties and oppression the like of which we have never experienced, so that our progress has been made under conditions of luxurious comfort in comparison with theirs.

1804. "*The London Dispensary for the Relief of the Poor Afflicted with Eye Disease*," the institution now universally familiar by the name of "Moorfields," founded by Dr. Cunningham Saunders, an aural surgeon as well as a distinguished oculist of his day. It is recorded that Dr. Saunders treated disease of the ear as well as the eye in this institution, which is not surprising seeing that he was one of the earliest British writers on subjects pertaining to the ear.

1814. "*Dublin Eye and Ear Hospital*," founded by Surgeon Ryall under the title of the "National Eye and Ear Hospital." To this institution came Sir William Wilde, who founded St. Mark's Ophthalmic Hospital in 1844, both institutions eventually being merged into the "Royal Victoria Eye and Ear Hospital." The original institution appears to have been at that time the only one of its kind in Great Britain where clinical and practical instruction in aural surgery was given to students, and if this version be correct, Sir William Wilde must be regarded as the earliest systematic teacher of aural surgery in this country.

1816. "*The Royal Ear Hospital*," London, founded by Dr. Harrison Curtis under the title of the "Dispensary for Diseases of the Ear." From its earliest days this institution has been situated in the vicinity of Dean Street, Soho, and has been favoured with Royal patronage throughout its career.

1818. "*Shrewsbury Eye, Ear and Throat Hospital*," founded by Dr. G. F. D. Evans as an ophthalmic institution; treatment of diseases of the ear under the same roof soon followed, and eventually that of the throat, hence its present title.

1820. "*Liverpool Eye and Ear Infirmary*," founded by Dr. J. O'Neill. To this institution in 1850 came Dr. John Nottingham, whose work on "Diseases of the Ear" was published in 1857.

1821. "*Leeds Eye and Ear Dispensary*." This institution during its career had a very large out-patient department, and six beds for in-patients. Mr. Thomas Nunnely was Surgeon from 1835 to 1864. In 1869 the institution amalgamated with the General Infirmary.

1834. "*Edinburgh Eye, Ear and Throat Hospital*," founded by local practitioners first as an eye hospital, and later in 1883 for the further objects indicated by its present title.

1838. "*Metropolitan Ear, Nose and Throat Hospital*," started as the "Ear Infirmary and Orthophonic Institution." Associated with this hospital in its early career was James Yearsley, who was followed by James Hinton and Peter Allen, the former leaving to take charge of the Aural Department at Guy's Hospital in 1863, and the latter to succeed Toynebee at St. Mary's in 1868.

1844. "*The Birmingham Institution* for the relief of Deafness and Diseases of the Ear" was founded mainly through the enterprise of Dr. Duffton, who in the same year published a work entitled "The Nature and Treatment of Deafness and Diseases of the Ear and of the Treatment of the Deaf and Dumb." This institution amalgamated in 1871 with the Birmingham Eye and Ear Hospital, and eventually the title became changed to the Birmingham and Midland Ear and Throat Hospital. Attached to this institution was Dr. Charles Warden, so well known to our older hospital staffs.

1844. "*Belfast Eye and Ear Hospital*," founded as a dispensary by Dr. Samuel Browne, Surgeon to the General Hospital in that city. His son, Dr. Walton Browne, is at the present time the Senior Surgeon of this much enlarged hospital.

1844. "*Dublin St. Mark's Ophthalmic Hospital*," founded by Sir William Wilde, for the treatment of eye and ear disease. This institution was eventually merged into the hospital previously alluded to as the Royal Victoria Eye and Ear Hospital.

1847. "*Kent County Ophthalmic Hospital*," Maidstone, founded by Lord Romney, the first President, and Mr. John Woolcott, F.R.C.S., the first Honorary Surgeon. Six years after the foundation of this hospital, it was agreed by the managers to treat ear disease as well as eye disease, but the first defined appointment of aural surgeon appears to be as recent as 1909, since which date has arisen a large ear and throat clinic.

1855. "*Manchester Ear Hospital*."

1857. "*Bradford Eye and Ear Hospital*," founded by Dr. Edward Bronner, whose son, Dr. Adolph Bronner, is now the Senior Surgeon at the same institution.

1861. "*Glasgow Ear, Nose and Throat Hospital*," founded by Dr. Paterson Cassells, one of the two Vice-presidents of the Section of Otology at the International Medical Congress of 1881; at a later date he was appointed aural surgeon to the Glasgow Royal Infirmary.

1863. "*Cork Ophthalmic Hospital*," now known as the Cork Eye, Ear and Throat Hospital, founded by Dr. Macnaughton Jones, who also founded the Hospital for Women and Children in the same city.

1863. "*The Hospital for Diseases of the Throat*," London, founded

by Sir Morell Mackenzie, the first President of the original Laryngological Association, and the founder in 1887 with Dr. Norris Wolfenden of this Journal.

1871. "*Belfast Eye, Ear and Throat Hospital*," founded by Dr. W. A. McKeown.

1874. "*Central London Throat and Ear Hospital*," founded by Mr. Lennox Browne.

1875. "*Manchester Hospital for Consumption and Throat Disease*," founded by Dr. Hodgkinson and Dr. Fletcher.

1877. "*Dublin Throat and Ear Hospital*."

1878. "*Brighton Throat and Ear Hospital*," founded mainly through the energy of Dr. Cresswell Baber and Dr. Scatliff.

1878. "*Tunbridge Wells Eye and Ear Hospital*."

1878. "*Newcastle Throat and Ear Hospital*," founded by Dr. Richard Ellis.

1881. "*Londonderry Eye, Ear and Throat Hospital*," founded by Drs. Donaldson, Bernard and Hunter.

1882. "*Hereford Eye and Ear Hospital*."

1884. "*Portsmouth Eye and Ear Hospital*," with the foundation of which Dr. Ward Cousins was so closely identified.

1886. "*Halifax Eye and Ear Hospital*," founded by Dr. Oakley.

1887. "*London Throat Hospital*," founded by Drs. Edward Woakes, MacNeil Whistler, George Stoker and others.

1888. "*Manchester Eye and Ear Hospital*," founded by Dr. David McKeown.

1889. "*Cheltenham Eye, Ear and Throat Hospital*."

It is interesting to note how frequently institutions started primarily for the treatment of diseases of the eye extended their sphere of action to the ear and throat. Only in one instance can we recall an old institution founded, and continued up to this day, for the purpose of treating the ear alone, but even in this institution simultaneous treatment of the nose and throat with that of the ear has been necessarily called for. In this day, when one hears so much of co-ordination and consolidation of medical work, the often-repeated suggestion as to the advantage of treating the eye, ear, throat and nose under one roof seems to be worthy of more than passing consideration.

Before taking leave of the special hospitals, some reference must be made to the educational side of their work, and if the following figures prove anything at all, they forcibly prove that these institutions—the pioneers of post-graduate teaching in this country—have been eminently successful as medical schools for special subjects. Have not the ophthalmic and the aural surgeons, and the laryngologists at the general hospitals, qualified for those positions in the special hospitals?

From records available for 1912, we find that 924 students enrolled themselves, for periods of three months and upwards, at twenty Metropolitan special hospitals, including those for the eye, ear and throat, skin, paralysis, women, consumption and cancer, whilst the number of medical practitioners attending, in a casual way, at these particular hospitals to witness the practice of the medical staff amounted to over 2000.

At two of the Throat and Ear Hospitals in London where special provision is made for systematic instruction the number of post-graduate students in 1912 was close upon a hundred, and the number of practitioners attending the lectures and the clinics from time to time was upwards of a thousand.

Here, then, is a rough outline of the activity of our specialism as

exemplified by the establishment of special hospitals. The remarkable progress made by these institutions brings with it a feeling of astonishment that there should have been at any time an attempt to arrest their growth and development.

Great as has been the activity within these institutions, greater still has been the apathy towards the establishment of special departments in the general hospitals. The cause of this apathy is, however, an old story familiar to all of us, and we like to think that it is now buried in the cabinet of medical curiosities. Let us therefore dwell on the more agreeable and the useful aspect of our specialty, resting content with the unmistakable testimony that every special department established in a general hospital is a tribute to special hospitals.

The earliest special aural department at a general hospital appears to be that of St. Mary's Hospital, London. It was inaugurated in 1851, six years after the foundation of the hospital itself. This department was placed in charge of Joseph Toynbee, F.R.S., whose work on "Diseases of the Ear" was dedicated "To the Governors who, by establishing aural surgery as a distinct department of study in their hospital and medical school, evinced a desire to elevate the subject of diseases of the ear to its due position, as a branch of professional knowledge, based upon clinical observation and scientific research."

In 1844, at St. Mark's Ophthalmic Hospital, Dublin—a purely special hospital—Sir William Wilde had an aural department, and there he adopted a systematic method of instruction to students. It is reasonable to suggest that the influence of the teaching of these two distinguished specialists was the starting-point of special departments, but the establishment of these departments was a slow process. There was always a prejudice on the part of the leaders of the medical profession against specialism, a prejudice which, fortunately, was mirthfully ignored by those who were fast breaking away from the crystallised orthodoxy of the sedate general hospitals.

Another element which delayed the progress of the specialty was the fact that aural surgery and laryngology, unlike ophthalmic surgery, formed little or no part of the student's curriculum, and a still smaller part of any qualifying examination; its study, therefore, was deplorably neglected. Is it, then, to be wondered at that the late Sir Henry Butlin, President of the Royal College of Surgeons, explaining the position of laryngology and otology when he entered the profession, should have placed on record the statement that—"The special departments in the hospitals were officered by men who were too often very ignorant of their specialties, and there were specialists who really knew their work, but were carefully excluded from the general hospitals."

Here and there are to be found isolated instances of an eye and ear department of earlier dates than those we have just mentioned; such, for example, is that of the Royal City of Dublin Hospital, which established, at the time of its foundation in 1832, special dispensaries for the eye and ear.

This combination of the eye and ear in one department has been continued down to the present time, and is an imitation of the procedure adopted by the earlier special hospitals which combined the eye and ear under one roof and frequently under the single title of "eye hospital." This combination is, in some districts, still in force, particularly in Ireland. The Kent County Ophthalmia Hospital has increased its scope by admitting diseases of the ear, nose and throat, but it does not appear to have added this designation to its title, in spite of the fact that in

1912 the attendance of aural patients was nearly as great as that of the eye cases, whilst the operations upon the ear were actually greater in number than those upon the eye.

Many years, however, passed before either the eye or the ear cases were treated in separate departments having an entity of their own, and even when separate departments were established, little or no interest was taken in them by the managers; they were badly equipped, and they were carried on in a perfunctory kind of manner with a sort of "Box and Cox" arrangement of attendance. In this way they crept along until the younger generation of medical officers, fresh from the special hospitals, brought with them newer ideas and keener enthusiasm than had hitherto prevailed, so that these departments speedily became recognised as not the least important part of the organisation of the hospital. A new problem now faces the managers—the necessity for additional in-patient accommodation for ear and throat cases.

The present infinitesimal allotment of beds for the ear and throat departments is ludicrous—in some cases the proportion is no more than one bed per thousand out-patients, whereas five beds per thousand are required. We anticipate that the next agitation will be to secure separate wards for each special department commensurate with the importance and the amount of the work carried on.

One of the many pleasant features of the present-day hospital system is the hearty co-operation which takes place between the general and the special hospitals; nowadays it is a common practice to transfer patients from one institution to the other, and we should welcome a development of this practice. In some of the large centres this well organised co-operation has rendered it unnecessary for the general hospital to establish a special department of its own. How much more useful is this collegial intercourse and goodwill than the former attitude of self-sufficiency.

Space prevents us dwelling any further on our theme, and we close it in the belief that our specialty has added something "to the world's store of scientific truth" and to the happiness of mankind.

A List of some of the Special Departments for Ear and Throat at the General Hospitals, with the Date of their Inauguration. It has been impossible to follow the foundation of these departments step by step, and therefore the list is not offered as a complete one, but it serves the purpose of showing the progress in different parts of the Kingdom. Many large General Hospitals have no Ear or Throat department on account of the near proximity of a Special Hospital to which patients are referred.

	Ear Depart- ment.	Throat Depart- ment.	
St. Mary's Hospital, London	1851	1864	Combined as
Mr. Joseph Toynbee, F.R.S., attached	1851-1864.		Ear, Nose and
Mr. Ernest Hart	1864-1868.		Throat, 1908
Mr. Peter Allen	1868-1873.		
Mr. George Field	1873-1899.		
Guy's Hospital	1863	1885	Combined
Mr. James Hinton attached	1863.		1902.
St. Bartholomew's Hospital, Rochester	1863	1863	Separate.

	Ear Depart- ment.	Throat Depart- ment.	
London Hospital	1866	1901	Combined 1913.
Dr. Hughlings Jackson, first Physician-in-Charge Ear Department, 1867.			
Mr. Rivington, first Surgeon-in-Charge Ear De- partment, 1867.			
Mr. Reeves, Surgeon-in-Charge Ear Department, 1869.			
Dr. Gardiner Brown " " 1876.			
Dr. Edward Woakes " " 1882.			
St. Bartholomew's Hospital, London	1867	1878	Separate.
Sir Thomas Smith } first Officers-in-Charge of			
Mr. John Langton } Ear Department.			
Sir Lauder Brunton } first Officers-in-Charge of			
Sir Henry Butlin } Throat Department.			
Leeds General Infirmary: 50 beds specially allotted to the Ear Department (1912)	1869		Combined as Eye and Ear upon the amalgamation of the Eye and Ear Dispensary: sepa- rate since 1912.
St. George's Hospital	1872	1872	Separate
Sir William Dalby in charge of Ear Department.			
Glasgow Royal Infirmary	1873	1873	Combined at first, now separate.
Dr. Paterson Cassells in charge of Ear Department, 1887.			Separate.
Dr. Stevens' Hospital, Dublin	1874	1880	"
King's College Hospital, London	1876	1892	
Dr. Urban Pritchard first Officer-in-Charge of Ear Department and Professor of Aural Surgery.			
St. Thomas's Hospital	1877	1877	
Sir Felix Semon, Physician Throat Department, 1882-1897.			
Dundee Royal Infirmary	1879		Ear and Throat com- bined.
Middlesex Hospital	1880		Combined.
Edinburgh Royal Infirmary	1883		"
Chester Infirmary	1885		Eye and Ear combined.
Mater Misericordiae Hospital, Dublin	1885	1885	Separate.
Westminster Hospital	1886		Combined.
Leicester Infirmary	1890		"
Royal Infirmary, Bradford	1891	1891	"
Royal Victoria Infirmary, Newcastle	1893	1893	"
Liverpool Royal Infirmary	1893	1893	"
Liverpool Southern Hospital	1894	1896	Combined in 1911.
Addenbrook's Hospital, Cambridge	About	1894	Combined.
Bristol General Hospital	"	1894	Separate.
Sheffield Royal Hospital	1897	1897	Combined.
Southampton Hospital	1899		"
Reading Hospital	1900		"
Birmingham General Hospital	1902		"
Sir Patrick Dun's Hospital, Dublin	1906		"
Derby Royal Infirmary	1906		"
Bristol Royal Infirmary	1912	1906	Separate.
Radcliffe Infirmary, Oxford	1906		Combined.
Cheltenham General Hospital	1909		Eye, Ear, Nose and Throat combined.
Lincoln County Hospital	1913		Combined.

ONE OF THE OLD GUARD.

BY DR. CHAS. IREDELL,
Melbourne, Australia.

AT the Australian Medical Congress held at Sydney, September, 1911, I read a paper entitled "Retrospect of a Specialist's Life," in which I claimed to have been probably longer in the practice of these specialties than any living Anglo-Saxon. Two years have passed since then, and I still believe the statement to hold good. At any rate no one has claimed precedence: perhaps few would *care* to! This is the age of the young and the new, and it is not everyone who desires to be thought a museum specimen. Anyhow, it is certain that I joined Sir William Dalby—then Mr. Dalby—as his assistant in 1874, and at that time, if my memory serves me no tricks, Mr. Harvey, of Golden Square, and Mr. Morell Mackenzie—afterwards Sir Morell—were, at any rate, the only well-known names in London in connection with these specialties. Mr. Dalby had purchased Mr. Hinton's practice, and the vacancy at Guy's was not filled up for some months, when eventually Mr. Laidlaw Purvis was appointed. Shortly after this, appointments were made at King's College and St. Mary's, but it was some years before Mr. Cumberbatch was placed at St. Bartholomew's, and then the other hospitals fell into line pretty rapidly. At the time I speak of the oculist and the gynecologist were fairly well established, but ear, nose and throat work was looked upon askance. One of the earliest witticisms I remember thrown at ear work was attributed to a very eminent physician of that day, who said there were only two kinds of deafness: one that any d——d fool could cure, and the other that no d——d scoundrel could do anything for. Nevertheless, the name of Toynbee was of necessity always held in respect. I feel somehow to have been in touch with him, for in 18, Savile Row, while with Mr. Dalby, I occupied the very chair in which he died. It may have passed out of the memory of some that Mr. Toynbee was found dead in this chair with a silver catheter in his right nostril and a bottle of chloroform at his side. The uncharitable, of course, declared that he had committed suicide. As a matter of fact it was quite obvious that he had been experimenting on himself in the research which marked him as undoubtedly the greatest original worker in, and father of, English aural surgery. His invaluable and interesting collection of anatomical specimens is, as everyone knows, in the museum of the Royal College of Surgeons.

Thinking of him recalls to my mind a curious illustration of the extremely conservative character of the old world then, which has likely passed away now. The year before I came out to Australia (1885) I was taking charge of Sir William Dalby's practice, he being away shooting in Scotland. A very fine old gentleman of over eighty called. I made the usual regrets that Mr. Dalby should be away, etc., when he cut me short by saying, "My dear sir, you need make no excuses. I don't know Mr. Dalby, I never heard of Mr. Dalby, but I came to this house fifty years ago as a patient of Mr. Toynbee, and I thought that it might still be an aurist's house."¹ At this time there is no doubt whatever that these specialties were looked upon in anything but a favourable light by the older practitioners, especially so by the heads of the profession. I could cite many instances to show this, but one will suffice.

¹ It is interesting to be able to note that it is still an "aurist's house."—ED.

A young Frenchman of twenty-one, the son of wealthy parents in Bordeaux, had come over to England chiefly to acquire the language. The history of the case was one with which we are all painfully familiar. An old perforation dating from childhood and neglected. The external meatus was filled with a large polypus, which was removed by Mr. Dalby, and a granulating tympanic cavity was treated afterwards with gallic acid. He had complained of violent headaches, but these had greatly subsided after the polypus had been removed, and at this juncture, Mr. Dalby being due at an *important engagement* he had in Scotland on August 12, the case being considered as doing well, I was left in charge. Almost directly the severe pains returned, and the friends, very naturally thinking that my experience was not all-sufficient, called in other medical advice. Nevertheless in a few days the patient died. Chiefly owing to the chatter of the medical attendants a *post-mortem* was ordered, at which I was present, and a large abscess of the cerebellum found.

Well, it is possible that some of the men are still alive, so I will give no further details, but merely remark that there was strong medical testimony available to show that the death occurred as the result of the operation and subsequent treatment. I felt then very acutely what the position of the specialist was.

To-day, no doubt, there would still be a criticism on such a case, but it would take the different form of asking why some further operation had not been performed. In that day such a thing as exploring the lobes of the brain was unthought of—indeed, the opening of the mastoid cells by anything but a small drill was considered heroic and even a proceeding of grave danger.

It is also worth while recalling that at this time the insurance offices had not in the least grasped the danger to life of ear disease. To-day, in my opinion, they rather over-rate it. I have had some difficulty in getting cases passed who have suffered from discharge of the ears, the result of eczema.

The opposition of the medical world and specialism died very slowly. If anyone is now at all interested in this subject he should look up the *Fortnightly Reviews* for June, July and August of 1885, wherein he will find the bitter controversy between Dr. Morell Mackenzie and Dr. H. B. Donkin on this subject. In his remarks, June, 1885, Morell Mackenzie says: "Anyone who should take the trouble to glance through the medical journals of twenty-five years ago and compare the tone of their remarks on this subject with that of those of the present day could not fail to be struck by the contrast. The very name of 'specialist' was a bar sinister, excluding a man from the more coveted hospital appointments and from admission to some of the principal professional societies. The medical press lost no chance of abusing him, his brethren sneered at him in public and slandered him in private. Is it wonderful, then, that even moderate men brought up in the traditions of old-fashioned medical practice should have looked askance at specialism as something not quite orthodox or at least of questionable respectability?"

He further mentions that "the first International Congress that fully recognised specialist sections was that held in Copenhagen in 1884."

Just before I first became interested in this branch of surgery, the only means employed to pass air through the Eustachian tube, other than by the catheter, was by using what was called "Valsalva's method."

It is curious that this device of the celebrated Italian surgeon was used by him in the seventeenth century, and that it remained for Politzer to perfect it more than 200 years later. But, at any rate, Politzer's

method was a trump card in the hands of the aurist in my early days, and I well remember meeting an aurist very down in mouth, who said to me: "Our business is done: every blessed (I don't think that was the exact epithet) G. P. is using a Politzer's bag."

The use of reflected or concentrated light in the cavities with which we have to do was certainly not new in my time, but its use was not sufficiently appreciated, and even to-day no axiom is more important in the teaching of the student than that one has no right to *touch* anything one cannot *see*. I have seen, in search for a foreign body not much more than thirty years ago carried out in a London hospital, the patient under chloroform, and the instrument-table bearing an inconceivable assortment of forceps, even including tooth-forceps; with the result that the middle ear was completely disorganised, but no foreign body was removed! I regret to say that within the last decade a little girl was brought to me by the father, a medical man, who explained that he had troubled me because he had not quite the required instruments. The fact was, he said: "I am fond of taxidermy, and have some trays of artificial eyes on my study table and the child poked one of these eyes into her ear. I tried to take it out, but it was too far in, and when I again tried under chloroform to remove it, I found my forceps were not sufficiently fine." "By the way," he added, "I have brought the fellow-eye" (I have this in my collection of curiosities), "as I thought it might guide you in removing it." He then placed the eye in my hand, when I impulsively and most tactlessly said—forgetting that his wife was sitting on the sofa—"My dear sir, THAT could never have got into the child's ear." Of course, it was the old story, and I have reason to think from what I saw that he subsequently had a *mauvais quart d'heure* from the lady mother.

I believe we owe the introduction of the mirror to Prof. Anton von Tröltsch, who read a paper on the subject in 1855, although Dr. Hoffman, of Westphalia, had previously in 1841 used an ordinary shaving mirror for the examination of the ear.

Cocaine, which has been of such great service to us, either by itself or in combination, was unknown during the first year or two of my work. I cannot fix the exact year, but I remember procuring some for a very particular case Dalby had in hand, from Messrs. Bullock & Co., who were the only chemists in the west end of London who had it, and getting 2 gr. of this as a favour at the price of 30s. a grain. It was used for the removal of an aural polypus and acted very well. The price soon came down to something reasonable. Speaking of local anæsthetics, one saw queer things in those days. I was pretty regularly attending an aural clinic in London, and the aurist was personally well known to me. One morning I came into a rather crowded out-patient room and found much preparation going on. My friend, the aurist, told me he was going to remove a large polypus entirely filling the meatus, using ether spray as an anæsthetic. I expressed my doubts upon the usefulness of this, which I felt pretty strongly about, as I had only the day before seen in the St. George's out-patient department a woman fall insensible on the floor as the result of a student syringing her ear with *cold* water. Anyway, proceedings went on. The patient, a young man, was seated in an upright chair, resting the side of his head against a student standing on the far side. Two more students adjusting his head, the aurist then, sitting on a chair, commenced using a double-bulb spray apparatus (the present tubes had not been invented), and I watched curiously. In a few moments I saw his legs begin to beat the devil's

tattoo, and a moment later, with a wild shriek, the victim seemed to spring three feet straight into the air. The three students and the operator and his bottles were on the floor, and a figure was seen to go through a rapidly opening space in the crowd, never to reappear.

Perhaps the greatest stride in this branch of surgery in my time was the more general knowledge of post-nasal growths. Voltolini, Lowenburg and Moose all claimed to have known and operated on these growths as far back as 1862, but it was not until the production of Meyer's paper, published in Copenhagen in 1868, that the profession awoke to the fact that something was discovered which it seemed almost impossible to have been overlooked, and even then the awakening was somewhat slow, as will be seen from what I am about to tell. Exactly what other practitioners knew and did is, of course, impossible for me to say, but Sir William Dalby had by far the largest and best known aural practice in London at the time of which I speak, and even until 1884 the treatment of post-nasal growths was practically little thought of. In that year an influential Russian family, who resided in Eastbourne, had been patients of Mr. Dalby. One of the family, a Harrow school-boy, aged fifteen, had been travelling from St. Petersburg through Europe with his mother, and she had been persuaded to consult Prof. Moose at Heidelberg. This interview resulted in an arrangement by which Prof. Moose was engaged to come over to Eastbourne and operate on the boy. Mr. Dalby received an invitation to be present, but as it was inconvenient for him to go I was deputed to take his place. I shall always remember it as one of the most serio-comic scenes I ever witnessed. There were five other medical men, mostly local men, present by invitation. The boy was brought in and seated in an upright chair, to which he was lashed arms and legs by the Professor. He was then covered by a white sheet, and Moose himself had a sheet pinned round him—the first time, I may remark, that I had seen "*white*" worn in operating, black aprons being the custom in those days. A very elaborate gag was fastened by straps fixing it to the head, and Prof. Moose then curretted from side to side, rather violently it seemed to me, with a Langer's knife—a modification of which I afterwards devised, and I use a similar instrument to this day. It is easy to picture what followed: blood streamed from both nostrils and mouth, a good deal being blown and snorted over Prof. Moose, and the greater part of both sheets were painted red.

The next few operations of this sort that I saw and assisted in were performed under an anæsthetic, but so great was the fear of the blood finding its way into the larynx that this again was abandoned for a time, and the favourite method was to remove these adenoid vegetations with the forefinger nail. In fact, I remember one specialist (not a London man) who was very proud of his finger nail, and kept it in a case, Chinese fashion. Although in the earlier days to which I refer, nothing was done in the way of removing post-nasal growths, I cannot forget the very large measure of success in the treatment of deafness which followed the simple removal of enlarged tonsils. I have always thought that this must have been due to the local hæmorrhage depleting the adenoid vegetation, because tonsils, though they may pendulate, can never climb up sufficiently to obstruct the orifice of the Eustachian tube. At any rate, the fact remains that it *did* restore the hearing in a vast number of young people.

Curious cases one must come across in a life-time. I saw once a case of attempted suicide. The man had placed a small-calibre revolver

against his ear and fired. The ball was tightly embedded in the bony meatus, and the external tissues were much injured, but eventually he not only recovered but the ball was extracted with little or no injury, and the membrane and the hearing was quite slightly affected. Soon after starting work with Mr. Dalby I saw a case of his, an American magnate, who had decided to have a bust of himself made, and as a preliminary it was apparently necessary to have a plaster cast taken of his head. I understood that it was usual to protect the ears by placing wool in them, but somehow one of the ears was not thus protected, and in the process it became filled with plaster-of-Paris, and this set hard. The difficulties were certainly great, but I fancy the case would be dealt with quite differently now. In the attempt to remove the mass the foreign body broke off short at the narrow middle portion of the meatus, and any pressure, even the light touching with a probe, gave exquisite pain. All sorts of consultations took place, and chemists were applied to, if perchance they could find a solvent for the plaster-of-Paris. It was got away, but it was a long, tedious and painful business.

Another of those curious cases that set one thinking furiously occurred to me nearly twenty years ago in Melbourne. I saw a child, aged seven, in consultation with a medical man, suffering from an uncontrollable cough. It was difficult to satisfactorily examine the larynx of a child of that age, but so far as I could observe there was no laryngeal or pharyngeal condition to account for it. Matters got worse, a heavy purulent mucus was expectorated, and this on examination was found to contain tubercle bacilli in large quantities, and the case was then regarded as tuberculous. One day the local medical attendant was hastily called: the child had had an alarming paroxysm of coughing and was found cyanosed, but just after the doctor arrived another paroxysm of cough ensued, and a date-stone was brought up. That child is now a married woman with no sign of tuberculosis. Of course to-day the X rays would have located the trouble. One is tempted to recall case after case till one would become wearisome, but looking back over thirty-nine years of work at these specialties one cannot but feel deeply thankful for the marvellous advances that have been and are going on. These have been mainly the result of specialisation. Men like Toynbee and Dalby and Morell Mackenzie, who have devoted their lives to the work, attained great eminence only to give place to others climbing over their shoulders. The marvellous manual dexterity of Morell Mackenzie has been practically put into the possession of the following generation by the newer methods and the beautifully perfected mechanical aids and instruments now in our hands, and one does not see what I witnessed many years ago—an able-bodied surgeon pull a patient out of the chair by his nose, replace him, put his knee against his chest and haul out a polypus with the whole or greater part of the middle turbinal bone attached. Still, notwithstanding all our advances, nasal polypi return again and again, and atrophic rhinitis baffles us, so that there are still laurels to be won in this field of surgery.

The one great disappointment to me during my long connection with aural work is the little advance that has been made in the construction of instrumental assistance to hearing. The acoustical difficulties seem at present to be insurmountable, for the advertisement sheets of all the papers in the world show what a demand there is for such aid, and this has doubtless stimulated numbers of ingenious and scientific workers. My experience has taught me that not one deaf person in a thousand will use habitually any contrivance at present offered. They will purchase them,

try them, and put them on one side. I know of deaf people whose houses are stacked with these things discarded. The apparently paradoxical thing about it is, that the better the instrument enables the patient to hear the more trying does it become to the user.

The objections which arise from the annoyance of always holding something, of the ear-piece causing local discomfort, or even the greater objection of attracting attention might be suffered; but as the acoustical properties of the instrument magnify sound they also collect all sorts of overtones that become simply intolerable, so that the few people I have known who really use such things find the old-fashioned conversation tube by far the most satisfactory, and this instrument has been in use for ages. This matter, however, is not strictly within the function of the aural surgeon.

Looking back, then, over these years I fully believe that the result of this work will be to immensely lessen the proportionate number of deaf people in the future, and undoubtedly save the lives of many who would have died under the older conditions.

THE CLINICS OF BRITAIN FOR DISEASES OF THE THROAT, NOSE AND EAR.

Compiled by DAN MCKENZIE.

THE following compilation has been put together in order to show the number and dimensions of the special throat, nose and ear clinics of Great Britain and Ireland. It is based upon the replies to a series of circular letters which have been distributed to, I hope, all the special clinics in the three kingdoms, including the Kingdom of Man—which, by the way, is still quite innocent of any. I desire to take this opportunity of expressing to all my correspondents my most grateful thanks for the care and trouble they have exercised in rendering their information so thorough and accurate. Only in a very few instances has no response been made to the inquiries, and these I have marked with an asterisk.

The hospitals are arranged under their respective kingdoms and cities in alphabetical order, no distinction being made between general and special hospitals, between the comparatively ancient and the modern, and between the large and the small.

Only the names of the active medical staff are given. Exigencies of space forbade the inclusion of the consulting staffs. And for the same reason medical qualifications had to be omitted. In the eyes of the speciality all are specialists—pure or mixed.

In those general hospitals in which no beds are allotted to the special clinic, attention was nearly always drawn in the replies to the fact that beds are provided by the courtesy of the other members of the staff.

It is the hope of the compiler that this list may haply furnish those who are coming after us with some idea of the degree of activity to which our twin specialities have attained in this present year of grace.

Errors of omission and commission have doubtless crept in, in spite of all the attempts that have been made to keep close to the letter of the text. If any such are discovered the compiler prays, in anticipation, for the generous indulgence of the critic, trustfully grounding his petition upon the consciousness that if he has erred he has done so of inadvertence and not of malice aforethought.

LONDON.

The Bolingbroke Hospital (Ear and Throat Clinic).*Medical Officer.*—E. A. Peters.*Beds.*—None allotted. *In-patients* (annually), 33.*Out-patients* (new; annually), 852.*Out-patient Clinic.*—On Monday, 2 p.m.*Operations.*—*Minor and major*, on alternate Wednesdays, at 2 p.m.**The Central London Throat and Ear Hospital**, Gray's Inn Road, W.C.*Medical Officers.*—P. Jakins, Chichele Nourse, P. H. Abercrombie, W. Stuart-Low, A. Wylie, J. Atkinson, Dan McKenzie, H. Kisch, and nine registrars.*Beds.*—30. *In-patients*, 977.*Out-patients*, 11,036. Daily. Tuesday and Friday, 5 p.m.; other days, 2 p.m.*Operations.*—*Minor*, daily, 9 a.m. *Major*, daily (save Saturday), 2 p.m.*Instruction.*—Daily at clinics. Complete lecture courses for specialists and post-graduates.**Charing Cross Hospital** (Ear and Throat Clinic).*Medical Officers.*—E. B. Waggett, E. D. Davis, and two clinical assistants.*Beds.*—3. *In-patients*, 130.*Out-patients*, 5583. Tuesday and Friday, 8.30 a.m. Children, Monday, 10 a.m.*Operations.*—*Minor*, Friday, 8.30 a.m.; alternate Mondays, 10 a.m. *Major*, Tuesday and Friday, 12 noon.*Instruction.*—Tuesday, 10 a.m.**The City of London Chest Hospital**, Victoria Park, S.E. (Throat Clinic).*Medical Officer.*—W. G. Howarth.*Beds.*—None allotted. *In-patients*, no record.*Out-patients*, 470. Thursday, 9.30 a.m.*Operations, etc.*—Thursday, 9.30 a.m.**The Evelina Hospital for Sick Children**, Southwark Bridge Road, S.E. (Ear and Throat Clinic).*Medical Officer.*—J. F. O'Malley.*Beds.*—2. *In-patients*, 70.*Out-patients*, 1100. Friday, 2 p.m.*Operations.*—*Minor*, Wednesday, 10 a.m. *Major*, as required.**The German Hospital**, Dalston, N.E. (Ear and Throat Clinic).*Medical Officer.*—G. J. Jenkins.*Beds.*—4. *In-patients*, 133.*Out-patients*, 1865. Tuesday and Friday, 2 p.m.*Operations.*—*Minor*, after out-patient clinic. *Major*, Saturday, 2 p.m.**The Great Northern Central Hospital** (Ear and Throat Clinic).*Medical Officers.*—J. G. French and H. T. Mant.*Beds.*—6. *In-patients*, 96.*Out-patients.*—1600. Tuesday and Friday, 2.30 p.m.*Operations.*—*Minor*, Tuesday and Friday, 3 p.m. *Major*, Wednesday, 2.30 p.m.

Guy's Hospital (Ear and Throat Clinic).*Medical Officers.*—W. M. Mollison and T. B. Layton.*Beds.*—10. *In-patients*, 600.*Out-patients*, 5597. Daily, save Monday and Saturday.*Operations.*—*Minor*, Wednesday and Friday, 4 p.m. Thursday, 12.15 p.m. *Major*, Monday, 10 a.m. and 1.30 p.m. Thursday, 11 a.m., Friday, 10 a.m.*Instruction.*—At Clinic, and Tuesday and Thursday, 1.30 p.m. Thursday, 10 a.m.**Hampstead General and North-West London Hospital** (Ear and Throat Clinic.)*Medical Officer.*—Harold Barwell.*Beds.*—2. *In-patients*, 15.*Out-patients.*—1452. Tuesday, 9.30 a.m.*Operations.*—*Minor* (by resident medical officer), Thursday, 11 a.m. *Major*, as required.**The Homœopathic Hospital**, Great Ormond Street (Ear and Throat Clinic).*Medical Officers.*—D. Wright and V. Green.*Beds.*—None allotted. *In-patients*, 58.*Out-patients*, 1008. Wednesday, 2.30 p.m.*Operations*—Wednesday, 2.30 p.m.**Hospital for Consumption**, Brompton (Ear and Throat Clinic).*Medical Officer.*—Dundas Grant.*Beds.*—None allotted. *In-patients*, 237.*Out-patients.*—840. Tuesday, 2 p.m.*Operations.*—*Minor*, alternate Thursdays, 2 p.m. *Major*, as required.*Instruction.*—At Clinics. Lessons in laryngoscopy, etc., arranged during courses of instruction.**Hospital for Diseases of the Throat**, Golden Square, W.*Medical Officers.*—J. W. Bond, C. A. Parker, Fitzgerald Powell, F. A. Rose, T. Jefferson Faulder, G. W. Badgerow, Norman Patterson, C. W. M. Hope, Lionel Colledge, and clinical assistants.*Beds.*—60. *In-patients*, 1225.*Out-patients.*—11,579. Daily, 1.30 p.m. Also Tuesday and Friday, 6.30 p.m. Monday, 9 a.m. (children only).*Operations.*—*Minor*, daily (save Monday and Thursday), 10 a.m. *Major*, daily (save Monday), 10 a.m. On Thursday and Friday, 2 p.m.*Instruction.*—Daily at clinics. Complete lecture courses for specialists and post-graduates.**Hospital for Epilepsy, etc.**, Maida Vale, W. (Ear and Throat Clinic).*Medical Officer.*—F. F. Muecke.*Beds.*—None allotted. *In-patients*, 50.*Out-patients.*—60. Wednesday, 10 a.m.

“The ear and throat surgeon is called into consultation by the neurologists, and operates on out- and in-patients when required.”]

The Hospital for Sick Children, Great Ormond Street (Ear Clinic).*Medical Officer.*—G. E. Waugh.*Beds.*—None allotted. *In-patients*, 11.*Out-patients.*—615. Thursday, 1.30 p.m.

Operations.—*Minor*, Thursday, 1.30 p.m. *Major*, Tuesday and Friday, 1.30 p.m.

Instruction.—Tuesday, Thursday and Friday, 1.30 p.m.

The Italian Hospital, Queen's Square, W.C. (Ear and Throat Clinic).

Medical Officer.—Jas. Donelan.

Beds.—None allotted. *In-patients*, 208.

Out-patients.—624. Wednesday, 2.30 p.m.

Operations.—*Minor* and *major*, Thursday, 2.30 p.m.

Kensington and Fulham General Hospital (Ear and Throat Clinic).

Medical Officer.—Cyril Horsford.

Beds.—None allotted. *In-patients*, 80.

Out-patients.—2180. Tuesday, 2.30 p.m.

Operations.—*Minor*, Tuesday, 4 p.m. *Major*, Thursday, 2 p.m.

King's College Hospital ([a] Ear Clinic).

Medical Officers.—A. H. Cheatle and G. J. Jenkins.

Beds.—6. *In-patients*, 109.

Out-patients.—787. Monday and Thursday, 2 p.m.

Operations.—*Minor*, Saturday, 9 a.m. *Major*, Wednesday, 2 p.m.

Instruction.—At clinics. Lectures, Thursdays during February, 4.15 p.m.

([b] Throat Clinic).

Medical Officer.—Sir StClair Thomson.

Beds.—6. *In-patients*, 134.

Out-patients.—604. Tuesday and Friday, 2 p.m.

Operations.—*Minor*, Friday, 9 a.m. *Major*, Thursday, 2 p.m.

Instruction.—At clinics. Lectures, Tuesday, 4.30 p.m., from January 6 to March 14.

The London Hospital (Ear and Throat Clinic).

Medical Officers.—H. Lambert Lack, Hunter F. Tod, with two registrars and clinical assistants.

Beds.—19. *In-patients*, 360.

Out-patients.—10,187. Daily, 9 a.m.

Operations.—*Minor*, daily, 9.30 a.m., save Thursday and Friday. *Major*, Tuesday and Thursday, 2 p.m.

Instruction.—Wednesday and Friday, 12 noon.

The London Throat Hospital, Great Portland Street, W.

Medical Officers.—C. Woakes, G. C. Cathcart, W. H. Kelson, Atwood Thorne, Somerville Hastings, Irwin Moore, F. F. Muecke, and clinical assistants.

Beds.—14. *In-patients*, 503.

Out-patients.—3479. Daily, 1.30 p.m. Tuesday and Friday, 6 p.m.

Operations.—*Minor* and *major*, daily, 9.30 a.m.

Instruction.—Daily at 2 p.m.

The Medical Graduates' College and Polyclinic, 22, Chenies Street, Gower Street, W.C. (Ear and Throat Lectures, etc.).

Lecturers.—Most London specialists.

Ear and Throat Clinic.—Selected cases. Friday, 4 p.m.

Classes.—*Laryngology*, J. Gay French. *Otology*, Dan McKenzie. *Rhinology*, W. Stuart Low.

* **The Metropolitan Hospital**, Kingsland Road, N.E. (Ear and Throat Clinic).

Medical Officer.—W. Ashdowne.

The Metropolitan Ear, Nose and Throat Hospital, Fitzroy Square, W.

Medical Officers.—L. H. Pegler, F. Spicer, Jobson Horne, J. Coubro Potter, H. Buckland Jones, H. Whale, W. H. Jewell, Wm. Ibbotson, Alex. Gavin, P. Franklin, and clinical assistants.

Beds.—20. *In-patients*, 382.

Out-patients—2337. Daily, 2.30 p.m., and Monday, Wednesday and Friday, 6 p.m.

Operations.—*Minor* and *major*, daily (except Monday and Saturday), 9.30 a.m.

Instruction.—At clinics and by arrangement. Special courses are given.

Middlesex Hospital, Berners Street, W. (Ear and Throat Clinic).

Medical Officer.—Somerville Hastings, and four clinical assistants.

Beds.—6. *In-patients*, 200.

Out-patients.—206. Tuesday and Friday, 9 a.m.

Operations.—*Minor*, Thursday, 9 a.m. *Major*, Wednesday, 2 p.m.

The Miller General Hospital, Greenwich Road, S.E. (Ear and Throat Clinic).

Medical Officer.—Wallace Ashdowne.

Beds.—4. *In-patients*, no record.

Out-patients.—1251. Tuesday, 2 p.m.

Operations.—*Minor*, Tuesday, 4 p.m.

Mount Vernon Hospital for Consumption (Throat Clinic).

Medical Officer.—E. D. Davis.

Beds.—10. *In-patients*, no record.

Out-patients.—480. Monday, 4 p.m.

Operations.—Monday, 4 p.m.

Instruction.—At clinics.

National Hospital for the Paralysed, etc., Queen Square, W.C. (Ear and Throat Clinic).

Beds.—None allotted. *In-patients*, no record.

Out-patients.—No statistics. Thursday, 2 p.m.

Operations.—As required.

Medical Officer.—Sydney Scott.

Paddington Green Children's Hospital, W. (Ear and Throat Clinic).

Medical Officer.—E. A. Peters, and two clinical assistants.

Beds.—1. *In-patients*, 50.

Out-patients.—1935. Tuesday, 2 p.m.

Operations.—*Minor* and *major*, Friday, 1 p.m.

The Prince of Wales's General Hospital, Tottenham, N.E. (Ear and Throat Clinic).

Medical Officer.—H. O. Gillies, and two clinical assistants.

Beds.—7. *In-patients*, 60.

Out-patients.—1614. Monday, 2 p.m.

Operations.—*Minor*, Thursday, 5.30 p.m. *Major*, Wednesday, 2 p.m.

* **The Queen's Hospital for Children**, Hackney Road, Bethnal Green, E. (Ear and Throat Clinic).

Medical Officer.—W. G. Howarth.

The Royal Ear Hospital, Soho Square, W.

Medical Officers.—Macleod Yearsley, R. Lake, R. Sturgeon Cocke, E. A. Peters, H. A. Kisch, J. F. O'Malley, and clinical assistants.

Beds.—20. *In-patients*, 566.

Out-patients.—2430. Daily (except Saturday), 2 p.m. and 6 p.m.

Operations.—*Minor*, alternate Thursdays, 9 a.m. *Major*, Tuesday, Thursday and Friday, 2 p.m.

The Royal Free Hospital, Gray's Inn Road, W.C. (Ear and Throat Clinic).

Medical Officer.—J. Gay French.

Beds.—6. *In-patients*, 250 (approximate).

Out-patients.—Wednesday and Saturday, 9.30 a.m.

Operations.—*Minor*, Saturday, 10.30 a.m. *Major*, Thursday, 9.30 a.m.

Instruction.—At clinics, and two courses of eight lectures each.

The Royal Waterloo Hospital for Women and Children (Ear and Throat Clinic).

Medical Officer.—G. N. Biggs.

Beds.—None allotted. *In-patients*, 221.

Out-patients.—1000. Wednesday, 2 p.m.

Operations.—*Minor*, Wednesday, 1 p.m. *Major*, Wednesday, 1 p.m.; Friday, 9 a.m.

Instruction.—At clinics.

St. Bartholomew's Hospital, Smithfield, E.C. ([a] Ear Clinic).

Medical Officers.—Ernest West, Sydney Scott, and J. F. O'Malley.

Beds.—20 (jointly with Throat Clinic).

Out-patients.—2592. Monday and Thursday, 1.30 p.m. Tuesday and Friday, 9 a.m.

Operations.—*Minor*, during out-patient clinic. *Major*, Monday, 4 p.m.; Wednesday, 9 a.m.; Thursday, 9 a.m.

Instruction.—At clinics, and six lectures in February and March.

(b Throat Clinic.)

Medical Officers.—W. D. Harmer, F. A. Rose, T. J. Faulder.

Beds.—20 (jointly with Ear Clinic).

Out-patients.—3614. Monday and Thursday, 2 p.m.; Tuesday and Friday, 9.30 a.m.

Operations.—*Minor*, during out-patient clinic. *Major*, Monday, 3 p.m.; Wednesday, 1.45 p.m.; Tuesday and Friday, 1.45 p.m.

Instruction.—At clinics, and six lectures in May.

St. George's Hospital, Hyde Park Corner, W. ([a] Ear Clinic).

Medical Officer.—W. C. Bull.

Beds.—4.

Out-patients.—624. Monday, 1.30 p.m.

Operations.—No fixed hours.

(b Throat Clinic.)

Medical Officer.—Harold Barwell.

Beds.—4.

Out-patients.—723. Friday, 1.30 p.m.

Operations.—*Minor*, Friday, 2 p.m. *Major*, Wednesday, 2 p.m.

St. Mary's Hospital, Paddington, W. (Ear and Throat Clinic).*Medical Officers.*—W. Hill and C. J. Graham, and two assistants.*Beds.*—8. *In-patients*, 357.*Out-patients.*—4836. Monday and Thursday, 9 a.m. Friday, 2.30 p.m.*Operations.*—*Minor*, Monday and Thursday, 9 a.m. *Major*, Wednesday, 2 p.m.*Instruction.*—Once a month and at out-patient clinic. Special demonstration once a week.**St. Mary's Hospital for Women and Children, Plaistow, E. (Ear and Throat Clinic).***Medical Officer.*—S. J. Wareham.*Beds.*—None allotted. *In-patients*, 16.*Out-patients.*—614. Friday, 1 p.m.*Operations.*—Friday afternoon.**St. Thomas's Hospital ([a] Ear Clinic).***Medical Officer.*—H. J. Marriage.*Beds.*—None allotted. *In-patients*, no record.*Out-patient.*—1257. Monday and Thursday, 1.30 p.m.*Operations.*—*Minor*, Wednesday, 9.30 a.m. *Major*, Tuesday and Friday (afternoon). According to arrangement.*Instruction.*—At clinic. Clinical lectures occasionally.**([b] Throat Clinic.)***Medical Officer.*—W. G. Howarth.*Beds.*—None allotted. *In-patients*, no record.*Out-patients.*—687. Wednesday, 1.30 p.m. Friday, 9.30 a.m.*Operations.*—*Minor*, Friday, 9.30 a.m. *Major*, according to arrangement.*Instruction.*—At clinics. Clinical lectures occasionally.**The Seamen's Hospital, Greenwich, S.E. (Ear and Throat Clinic).***Medical Officers.*—R. Lake and G. N. Biggs.*Beds.*—3. *In-patients*, 38.*Out-patients.*—818. Monday and Thursday, 10 a.m.*Operations.*—*Minor* and *major*, Tuesday, 2 p.m.*Instruction.*—At clinics.**University College Hospital, Gower Street, W.C. (Ear and Throat Clinic).***Medical Officers.*—Herbert Tilley, Seecombe Hett and two assistants.*Beds.*—6. *In-patients*, no record.*Out-patients.*—1757. Tuesday and Friday, 9 a.m.*Operations.*—*Minor*, Tuesday and Friday, 12 noon. *Major*, Thursday, 2 p.m. Occasionally, Tuesday and Friday, 11 a.m.*Instruction.*—Tuesday and Friday, 9 a.m.**The West-End Hospital for Nervous Diseases (Ear and Throat Clinic).***Medical Officer.*—Dundas Grant.*Out-patients.*—600 (approx. attendances). Friday, 2 p.m.*Instruction.*—At clinic.

[“The beds are all devoted to the treatment of nervous diseases: where the aid of a specialist in ear and throat diseases is required the patient is referred to him.”]

The West London Hospital, Hammersmith, W. (Ear and Throat Clinic).

Medical Officer.—H. J. Davis and four clinical assistants.

Beds.—7. *In-patients*, 147.

Out-patients.—2313. Tuesday and Friday, 2 p.m.

Operations.—*Minor*, Tuesday and Friday, 4 p.m. *Major*, Wednesday and Saturday, 10 a.m.

Instruction.—Post-graduate, Tuesday and Friday, 4 p.m.

The Westminster Hospital (Ear and Throat Clinic).

Medical Officer.—P. R. W. de Santi.

Beds.—None allotted. *In-patients*, no record.

Out-patients.—744. Monday and Thursday, 2 p.m.

Operations.—*Minor*, Thursday, 3 p.m.

Instruction.—At clinic.

ENGLAND: PROVINCES AND WALES.

Birmingham: Ear and Throat Hospital.

Medical Officers.—C. J. Lewis, W. Lamb, W. Glegg, and Seymour Jones.

Beds.—48. *In-patients*, 1723.

Out-patients.—7438. Daily (except Saturday), 9.30 a.m.

Operations.—*Minor*, daily (except Wednesday and Saturday), 9 a.m. *Major*, Wednesday, Thursday and Saturday, 9 a.m.

Birmingham: General Hospital (Ear and Throat Clinic).

Medical Officer.—F. W. Foxcroft.

Beds.—3. *In-patients*, 139.

Out-patients.—1880. Monday and Thursday, 10 a.m.

Operations.—*Minor*, Monday, 9.30 a.m., in out-patient clinic. *Major*, Wednesday, Thursday and Saturday, 11 a.m.

Bournemouth: The Royal Victoria and West Hants Hospital (Ear and Throat Clinic).

Medical Officers.—W. H. L. Marriner and Anthony McCall.

Beds.—None allotted. *In-patients*, 61.

Out-patients.—560. Boscombe Branch: Wednesday, 3 p.m. Lowther Road Branch: Tuesday, 11.30.

Operations.—*Minor* and *major*, no fixed day; usually Wednesday.

Bradford: The Royal Infirmary (Throat Clinic).

Medical Officer.—A. Little.

Beds.—4. *In-patients*, 212.

Out-patients.—500. Tuesday, 2 p.m.

Operations.—Tuesday afternoon.

Instruction.—Tuesday afternoon.

Brighton: Ear and Throat Hospital.

Medical Officers.—A. H. Buck, A. J. Hutchison, A. J. Martineau, and H. E. Seatliff.

Beds.—20. *In-patients*, 279.

Out-patients.—1287. Monday, Thursday and Friday, 2.30 p.m.; Tuesday, Wednesday and Saturday, 11.30 a.m.

Operations.—*Minor* and *major*, no information to hand.

Bristol: The General Hospital ([a] Ear Clinic).

Medical Officer.—J. Lang Firth.

Beds.—4. *In-patients*, no record.

Out-patients.—No statistics. Monday, 1 p.m.

([b] Throat Clinic).

Medical Officer.—A. J. Wright.

Beds.—4. *In-patients*, no record.

Out-patients.—No statistics. Tuesday and Friday, 1 p.m.

Operations.—*Minor*, Friday, 12 noon. *Major*, Wednesday, 10 a.m.

Bristol: Royal Infirmary (Ear and Throat Clinic).

Medical Officer.—P. Watson-Williams.

Beds.—8. *In-patients*, 250.

Out-patients.—1800. Monday, Tuesday and Thursday, 11 a.m.

Operations.—*Minor*, Friday, 12 noon. *Major*, Wednesday, 1.30 p.m.

Cambridge: Addenbrooke's Hospital (Ear and Throat Clinic).

Medical Officer.—No appointment. (W. H. Bowen, Hon. clinical assistant.)

Beds.—None allotted. *In-patients*, no records.

Out-patients.—1420. Monday, Wednesday and Saturday, 11 a.m.

Operations.—*Minor*, Monday, Wednesday and Saturday, 2 p.m.

Major, Tuesday, Thursday and Friday, 11 a.m.

* **Cardiff Infirmary** (Ear and Throat Clinic).

Medical Officer.—D. R. Paterson.

Cardiff: The Royal Hamadryad Seamen's Hospital (Ear and Throat Clinic).

Medical Officer.—D. R. Patterson.

Beds.—None allotted. *In-patients*, 16.

Out-patients.—No record.

Operations.—*Minor* and *major*, as required.

Coventry and Warwickshire Hospital (Ear and Throat Clinic).

Medical Officer.—F. W. Sydenham.

Beds.—None allotted. *In-patients*, no record.

Out-patients.—1000. Thursday, 2.30 p.m.

Operations.—*Minor*, Thursday, 2.30 p.m. *Major*, when required.

Harrogate Infirmary (Ear and Throat Clinic).

Medical Officer.—E. S. Steward.

Beds.—10. *In-patients*, 80.

Out-patients.—500. Wednesday, 1.30 p.m.

Operations.—*Minor*, Friday morning. *Major*, Tuesday and Wednesday afternoon.

Leeds: The General Infirmary (Ear and Throat Clinic).

Medical Officers.—G. Constable Hayes and E. W. Bain.

Beds.—27. *In-patients*, 431.

Out-patients.—3966. Daily (Friday and Saturday excepted), 1.30 p.m.

Operations.—*Minor*, Wednesday and Thursday morning. *Major*, Monday and Tuesday morning.

Leicester: The Royal Infirmary (Ear and Throat Clinic).

Medical Officer.—F. W. Bennett.

Beds.—6. *In-patients*, 150.

Out-patients.—1825. Tuesday and Saturday, 9 a.m.

Operations.—*Minor*, Friday, 9 a.m. *Major*, Monday, 9 a.m.

Lincoln County Hospital (Ear and Throat Clinic).

Medical Officer.—J. J. Rainforth.

[No statistics available as clinic only opened this year.]

Liverpool: The Royal Infirmary (Ear and Throat Clinic).*Medical Officer.*—Thomas Guthrie and one clinical assistant.*Beds.*—None allotted. *In-patients*, no record.*Out-patients.*—1997. Monday and Thursday, 2 p.m.*Operations.*—*Minor* and *major*, Wednesday, 2 p.m.**Liverpool: Royal Southern Hospital** (Ear and Throat Clinic).*Medical Officer.*—W. Permewan.*Beds*—2. *In-patients*, 12.*Out-patients.*—311. Tuesday, 1.30 p.m.*Operations.*—*Minor*, Tuesday, 2 p.m. *Major*, as required.**Liverpool: The Stanley Hospital.***Medical Officer.*—J. E. McDougall.*Beds.*—4. *In-patients*, 37.*Out-patients.*—1361. Wednesday, 1.30 p.m.*Operations.*—*Minor*, Friday, 8.30 a.m. *Major*, Tuesday, 4 p.m.**Maidstone: Kent County Ophthalmic Hospital** (Ear and Throat Clinic).*Medical Officer.*—G. Potts.*Beds.*—20. *In-patients*, 300.*Out-patients.*—3000 (approx.)*Operations.*—*Minor*, Wednesday, 9.30 a.m. *Major*, Monday, 9.30 a.m.**Manchester: Children's Hospital** (Ear and Throat Clinic).*Medical Officer.*—F. H. Westmacott.*Beds.*—6. *In-patients* (ear, nose, throat and chest), 557.*Out-patients.*—(? attendances) 7279. Monday and Thursday, 9.30 a.m.*Operations.*—*Minor*, Monday. *Major*, Thursday.**Manchester: The Ear Hospital.***Medical Officers.*—J. H. Pinder, F. Cox, L. Larmuth, and Lindley D. Sewell.*Beds.*—24. *In-patients*, 873.*Out-patients.*—4089. Monday and Thursday, 9 a.m. Tuesday, Wednesday and Friday, 1.30 p.m.*Operations.*—*Minor*, in out-patient clinic. *Major*, daily (except Mondays), 9 a.m.*Instruction.*—Occasionally in out-patient clinic. Otherwise at days and times of major operations.**Manchester: The Royal Infirmary** (Ear and Throat Clinic).*Medical Officers.*—W. Milligan, F. H. Westmacott, and one assistant (vacant).*Beds.*—11. *In-patients*, 266.*Out-patients.*—1600. Wednesday and Saturday, 9 a.m.*Operations.*—*Minor*, Wednesday and Saturday, 12.30 p.m. *Major*, Wednesday and Saturday, 9 a.m.*Instruction.*—Wednesday and Saturday, 11 a.m.**Manchester and Salford: St. John's Ear Hospital.***Medical Officers.*—F. H. Westmacott, J. A. Jones, Knowles Renshaw, W. Wilson.*Beds.*—12. *In-patients*, 456.*Out-patients.*—3690. Daily, save Thursday, 9.30 a.m.*Operations.*—Tuesday, Thursday, Friday, 10 a.m.

Newcastle-on-Tyne: Royal Victoria Infirmary (Ear and Throat Clinic).*Medical Officers*.—S. S. Whillis and W. F. Wilson.*Beds*.—17. *In-patients*, 1017.*Out-patients*.—3255. Tuesday and Friday, 10 a.m.*Operations*.—*Minor* and *major*, Wednesday and Saturday.*Instruction*.—Tuesday and Friday.**Newcastle-on-Tyne: Throat and Ear Hospital.***Medical Officers*.—Jas. Don, W. J. Ruddock, Neil Maclay, T. H. Livingstone, W. J. Harrison, Sol. Cross, R. Gordon Bell, and Ernest Bertram Appleby.*Beds*.—11. *In-patients*, 252.*Out-patients*.—3467. Monday, Tuesday, Thursday and Saturday, 3 p.m.*Operations*.—*Minor* and *major*, Tuesday, Wednesday, Thursday and Friday, 9.30 a.m.*Instruction*.—At clinics. No special hours of instruction.**Newtown: Montgomery County Infirmary** (Ear and Throat Clinic).*Medical Officer*.—G. Russ Wood.*Beds*.—None allotted. *In-patients*, no record.*Out-patients*.—No statistics. Last Tuesday in each month at 10 a.m., and following Thursday at 2.30 p.m.*Operations*.—*Minor*, on days clinic is open.**Norfolk and Norwich Hospital** (Ear and Throat Clinic).

[No information available; clinic only recently started.]

Oxford: Radcliffe Infirmary and County Hospital (Ear and Throat Clinic).

[No information available; in course of reconstruction.]

Pleasley Cross, Lancashire: St. Helen's Hospital (Ear and Throat Clinic).*Medical Officer*.—Hugh E. Jones.*Beds*.—None allotted. *In-patients*, 73.*Out-patients*.—160. Friday, 2 p.m.*Operations*.—*Minor* and *major*, Friday, after out-patients.**Plymouth: Devon and Cornwall Ear and Throat Hospital.***Medical Officers*.—Geo. Jackson, C. E. Bean, and E. G. Smith.*Beds*.—6. *In-patients*, 35.*Out-patients*.—1275. Tuesday, Thursday and Saturday, 11 a.m.; Wednesday, 3 p.m.*Operations*.—*Minor*, Wednesday, 2.30 p.m.; Thursday, 9.30 a.m. *Major*, Friday, 10 a.m.**Portsmouth and South Hants Eye and Ear Infirmary** (Ear and Throat Clinic).*Medical Officers*.—C. A. Scott Ridout and A. M. Barford.*Beds*.—10, shortly to be increased. *In-patients*, 181.*Out-patients*.—998. Wednesday and Thursday, 2 p.m.; Saturday, 12 noon.*Operations*.—*Minor*, Wednesday and Thursday, 3 p.m. *Major*, Tuesday, 5 p.m.; Thursday, 3 p.m.

[“ Ear and Throat Department only separated from Ophthalmic

Department in 1906, when new staff was appointed. Since then the work has rapidly developed both as regards in-patients and out-patients, necessitating extension of hospital accommodation."]

Sheffield: The Royal Hospital (Ear and Throat Clinic).

Medical Officer.—Geo. Wilkinson.

Beds.—12. *In-patients*, 202.

Out-patients.—1872. Monday, Tuesday and Friday, 3 p.m.

Operations.—*Minor*, Monday 4 p.m.; Tuesday, 9 a.m. *Major*, Wednesday, 3 p.m.

Instruction.—Monday, Tuesday, Friday, 3 p.m.

Sheffield: The Royal Infirmary (Ear and Throat Clinic).

Medical Officer.—W. S. Kerr.

Beds.—15. *In-patients*, 310.

Out-patients.—1973. Monday and Thursday, 11 a.m.

Operations.—*Minor*, Wednesday, 11 a.m. *Major*, Monday, 2 p.m.

Instruction.—Clinical, in wards and out-patient clinic.

Southampton: Royal South Hants and Southampton Hospital (Ear and Throat Clinic).

Medical Officer.—W. P. Purvis.

Beds.—6. *In-patients*, 100.

Out-patients.—800. Wednesday, 11 a.m.; Friday, 2 p.m.

Operations.—*Minor*, Friday, 3 p.m. *Major*, Monday, noon.

Instruction.—At out-patient clinic.

Southport Infirmary (Ear and Throat Clinic).

Medical Officer.—W. Permewan.

Beds.—Not allotted. *In-patients*, 24.

Out-patients.—321. Thursday, 2 p.m.

Operations.—*Minor* and *major*, Thursday, and as required.

Stoke-on-Trent: The North Staffordshire Infirmary (Ear and Throat Clinic).

Medical Officer.—G. A. Carter.

Beds.—2. *In-patients*, no record.

Out-patients.—703. Thursday, 10.30 a.m.

Operations.—*Minor*, Thursday afternoon. *Major*, as arranged.

[Clinic only recently started.]

Swansea: General and Eye Hospital (Ear and Throat Clinic).

Medical Officer.—A. F. Blagdon Richards.

Beds.—6. *In-patients*, 10.

Out-patients.—960. Thursday, 2 p.m.

Operations.—*Minor*, Tuesday, 2.30 p.m.

Wakefield (Yorkshire): The Clayton Hospital (Ear and Throat Clinic).

Medical Officer.—Lionel T. Wells.

Beds.—None allotted. *In-patients*, no record.

Out-patients.—Numbers not recorded. Friday, 3 p.m.

Operations.—*Minor*, Monday, 11 a.m. *Major*, as arranged.

Walsall and District Hospital, Staffs. (Ear and Throat Clinic).

Medical Officer.—F. Sydenham.

Beds.—10. *In-patients*, 130.

Out-patients.—791. Tuesday and Friday, 9 a.m.

Operations.—*Minor*, Friday. *Major*, Wednesday.

* **Wolverhampton and Staffordshire General Hospital** (Ear and Throat Clinic).

Medical Officers.—J. A. Codd and E. Deanesley.

York: The County Hospital (Ear and Throat Clinic).

Medical Officers.—Peter Macdonald and M. D. Ferguson.

Beds.—15. *In-patients*, 174.

Out-patients.—993. Tuesday, 3 p.m. Friday, 11 a.m.

Operations.—*Minor*, Tuesday, 3 p.m. Friday, 11 a.m. *Major*, Monday, 1 p.m.

COMBINED EYE AND EAR, AND EYE, EAR AND THROAT CLINICS.

ENGLAND.—*London.*—None.

ENGLAND.—*Provinces:*

* **Accrington, Lancs.: The Victoria Hospital** (Eye and Ear Clinic).

Medical Officer.—J. S. Geddie.

Bath: The Ear and Eye Infirmary.

Medical Officer.—J. R. Benson.

Beds.—None. *In-patients*, none.

Out-patients.—2000. Tuesday, Thursday and Saturday, 11 a.m.

Operations.—*Minor*, Thursday. *Major*, at Brockley Home by arrangement.

[“The institution was founded in 1837 and is supported almost entirely by voluntary contributions. We are trying to raise a fund for beds.”]

Blackburn and East Lancashire Infirmary (Eye, Ear and Throat Clinic).

Medical Officer.—E. D. Scott-Heyliger.

Beds.—None allotted. *In-patients*, 137.

Out-patients.—1392. Wednesday, 10 a.m., Friday, 11 a.m.

Operations.—As required by arrangement.

Bradford: The Royal Eye and Ear Hospital.

Medical Officers.—Adolph Bronner and Andrew Little.

Beds.—65. *In-patients*, 1600.

Out-patients.—9000. Daily, 2 p.m.

Operations.—*Minor* and *major*, Monday, Tuesday, Wednesday and Thursday, 3.30 p.m.

Cheltenham: The Eye, Ear and Throat Free Hospital.

Medical Officer.—J. A. Bower.

Beds.—14. *In-patients*, no record.

Out-patients.—9378. Daily, 9.30 a.m.

Operations.—*Minor* and *major*, daily.

Cheltenham: The General Hospital (Eye, Ear and Throat Clinic).

Medical Officer.—Norman H. Pike.

Beds.—3 to 5. *In-patients*, no record.

Out-patients.—Numbers not available. Monday, Tuesday, Thursday and Friday, 2.30 p.m.

Operations.—*Minor* and *major.*—After out-patient clinic.

Instruction.—“Twice during the summer on Saturdays at 12.30 p.m. special clinics are given.”

*** Halifax: The Eye, Ear and Throat Hospital.***Medical Officers.*—J. Oakley and G. G. Oakley.*Beds.*—4.*** Hereford: The Victoria Eye and Ear Hospital.***Medical Officer.*—F. W. Lindsay.*Beds.*—20.**Huddersfield Royal Infirmary** (Eye and Ear Clinic—Throat and Larynx taken by all the surgeons).*Medical Officer.*—F. H. Knaggs.*Beds.*—None allotted. *In-patients*, no record.*Out-patients.*—1200. Monday, 2 p.m. Friday, 3 p.m.*Operations.*—Minor and major, Wednesday, 9 a.m.**Liverpool Eye and Ear Infirmary.***Medical Officers.*—H. E. Jones, E. Stevenson, E. M. Stockdale, H. Holmes and C. A. Adair Dighton.*Beds.*—30. *In-patients*, 800 (approx.)*Out-patients.*—3273. Daily, 1.30 p.m.*Operations.*—Minor, daily, 9 a.m. Major, daily, 4 p.m.*Instruction.*—At out-patient clinic. Special class for post-graduates, Thursday, 2 p.m.**Preston and County of Lancaster Queen Victoria Royal Infirmary** (Eye and Ear Clinic).*Medical Officers.*—W. Sykes and H. J. Taylor.*Beds.*—17. *In-patients*, 178.*Out-patients.*—931. Tuesday and Friday, 12 noon.*Operations.*—As and when required.**Shrewsbury: The Eye, Ear and Throat Hospital.***Medical Officers.*—C. G. Russ Wood and F. A. Anderson.*Beds.*—32. *In-patients*, 800.*Out-patients.*—4500. Daily, 9 a.m.*Operations.*—Minor, every morning. Major, Monday, Tuesday and Friday, 3 p.m.*Instruction.*—Daily, 9 a.m.**Tunbridge Wells Eye and Ear Hospital.***Medical Officers.*—D. Davis, E. L. Adeney and E. A. Starling.*Beds.*—16. *In-patients*, 316.*Out-patients.*—2846. Monday, Wednesday and Friday, 1.30 p.m.*Operations.*—Thursday, 10 a.m.**Wigan: The Royal Albert Edward Infirmary** (Eye, Ear and Throat Clinic).*Medical Officers.*—H. Holmes and H. H. Bywater.*Beds.*—12. *In-patients*, 350.*Out-patients.*—800 (approx.). Tuesday, 2 p.m.*Operations.*—Minor, Tuesday and Thursday, 2 p.m. Major, after out-patients

SCOTLAND.—EAR AND THROAT CLINICS.

Aberdeen: The Royal Infirmary (Ear and Throat Clinic).*Medical Officer.*—H. Peterkin.

Beds.—8. *In-patients*, no record. (In-patient department only recently started.)

Out-patients.—1347. Daily, 12 noon.

Operations.—*Minor* and *major*, Monday and Tuesday, 11 a.m.

Instruction.—Monday, Tuesday and Friday, at noon, during second term of winter session.

Dundee: The Royal Infirmary (Ear and Throat Clinic).

Medical Officer.—Robert P. Mathers.

Beds.—10. *In-patients*, 102.

Out-patients.—1483. Tuesday, Friday and Saturday, 9 a.m.

Operations.—*Minor* and *major*, Monday and Friday, 9 a.m.; Wednesday, 9 a.m. and 2 p.m.

Instruction.—In out-patient clinic.

*** Edinburgh: Deaconess Hospital** (Ear and Throat Clinic).

Medical Officer.—A. Logan Turner.

Edinburgh: The Eye, Ear and Throat Infirmary (Ear and Throat Clinic)

Medical Officers.—W. G. Sym, J. M. Farquharson, J. V. Paterson, W. G. Porter, E. M. Lithgow, and J. M. Darling.

Beds.—10. *In-patients*, 114 (ear and throat).

Out-patients.—1809 (ear and throat). Tuesday and Friday, 4 p.m.

Operations.—Various.

Instruction.—Various.

Edinburgh: The New Town Dispensary (Ear and Throat Clinic).

Medical Officer.—J. A. H. Duncan.

Out-patients.—170. Monday and Thursday.

Operations.—*Minor*, Monday and Thursday, 12 noon.

Edinburgh: Royal Hospital for Sick Children (Ear and Throat Clinic).

Medical Officer.—W. G. Porter.

Beds.—None allotted. *In-patients*, no record.

Out-patients.—Tuesday and Friday, 11 a.m.

Operations.—*Minor*, Wednesday, 9.30 a.m.

(This department only recently started.)

Edinburgh: The Royal Infirmary (Ear and Throat Clinic).

Medical Officers.—A. Logan Turner, J. Malcolm Farquharson, J. S. Fraser, and J. D. Lithgow.

Beds.—24. *In-patients*, 1020.

Out-patients.—4500. Daily (except Wednesday), 11 a.m.

Operations.—*Minor* and *major*, Tuesday and Wednesday, 11 a.m.

Instruction.—Clinical lectures: Monday, Tuesday, Thursday and Friday, 11 a.m.; and special post-graduate courses in August and September.

Edinburgh: The Western Dispensary (Ear and Throat Clinic).

Medical Officer.—J. D. Lithgow.

Out-patients.—Thursday, 4 p.m.

Operations.—*Minor*, Thursday, 4 p.m.

(Clinic only recently started.)

Glasgow: The Central Dispensary (Ear and Throat Clinic).

Medical Officers.—J. G. Connal, R. S. McKim, P. N. Grant, and John F. Fergus.

Beds.—In-patient department in process of formation.

Out-patients.—1000. Monday, 1 p.m.; Friday, 3 p.m.

Operations.—*Minor*, as required.

Glasgow: The Hospital for Diseases of the Ear, Nose and Throat.

Medical Officers.—Thos. Barr, Jas. G. Connal, W. S. Syme, J. Stoddart Barr, and Henry Whitehouse.

Beds.—12. *In-patients*, 189.

Out-patients.—3221. Daily, 9.30 a.m. Wednesday and Saturday; other days, 2 p.m.

Operations.—*Minor*, daily, 10 a.m. *Major*, no fixed hours.

Instruction.—At out-patient clinic, and on Mondays and Tuesdays, 2 p.m., for University students.

Glasgow: The Royal Hospital for Sick Children (Ear and Throat Clinic).

Medical Officers.—J. Walker Downie and L. MacLachlan.

Beds.—None allotted. *In-patients*, none.

Out-patients.—700. Tuesday and Friday, 11.30 a.m.

Operations.—As and when required.

Glasgow: The Royal Infirmary ([a] Ear Clinic).

Medical Officers.—J. Kerr Love, Jas. Adams, R. S. McKim, and — Leitch.

Beds.—10. *In-patients*, 126.

Out-patients.—1266. Tuesday and Friday, 3.30 p.m.

Operations.—*Minor*, Friday, 11 a.m. *Major*, Wednesday, 11 a.m.

Instruction.—At out-patient clinic. Post-graduate course in May. Wednesday and Thursday, 4 p.m.

([b] Throat Clinic.)

Medical Officers.—J. Macintyre, J. Fullarton, P. N. Grant, and J. Donald.

Beds.—10. *In-patients*, 209.

Out-patients.—2080. Tuesday and Friday, 10 a.m.

Operations.—*Minor*, Tuesday and Friday, 10 a.m. *Major*, any day, 3.30 p.m.

Instruction.—At out-patient clinic. Post-graduate course in May. Tuesday and Friday, 10 a.m.

Glasgow: The Victoria Infirmary ([a] Ear Clinic).

Medical Officers.—Albert Gray and W. Charles McCartney.

Beds.—4. *In-patients*, 17.

Out-patients.—676. Tuesday and Thursday, 1.30 p.m. Friday, 3.30 p.m.

Operations.—No fixed hours.

([a] Throat Clinic.)

Medical Officers.—A. Brown Kelly, J. L. Howie and J. A. Drever.

Beds.—4. *In-patients*, 83.

Out-patients.—1817. Monday, Wednesday and Thursday, 4 p.m.

Operations.—No fixed hours.

Glasgow: The Western Infirmary ([a] Ear Clinic).*Medical Officers.*—Thos. Barr and J. Stoddart Barr.*Beds.*—12. *In-patients*, no record.*Out-patients*, 1144. Monday and Thursday, 4 p.m.*Operations.*—*Minor* and *major*, Monday and Thursday.*Instruction.*—At out-patient clinic. (University lectureship.)

([b] Throat Clinic.)

Medical Officers.—Walker Downie and W. W. Christie.*Beds.*—12. *In-patients*, 1475.*Out-patients.*—3577. Tuesday and Friday, 4 p.m. Saturday, 9 a.m.*Operations.*—*Minor* and *major*, daily, 9 a.m.*Instruction.*—At out-patient clinic. University lectureship. ("About 95 per cent. of the students who graduate in medicine in the University of Glasgow attend this clinique.")**Greenock: The Eye Infirmary** (Ear and Throat Clinic).*Medical Officers.*—R. Fullerton and J. K. A. Robertson.*Beds.*—10. *In-patients*, 171.*Out-patients.*—1050. Monday and Thursday, 9 a.m.*Operations.*—No record.*Instruction.*—At out-patient clinic.**Leith Hospital** (Ear and Throat Clinic).*Medical Officer.*—J. S. Fraser.*Beds.*—None allotted.*Out-patients.*—700 (approx.). Monday and Thursday, 5 p.m.*Operations.*—*Minor*, Monday and Thursday, 6 p.m. (Department only started in August, 1912.)

IRELAND.

Cork: North Charitable Infirmary (Ear and Throat Clinic).*Medical Officer.*—J. B. Horgan.*Beds.*—None allotted.*Out-patients.*—756. Monday, Wednesday and Friday, 11 a.m.*Operations.*—*Minor*, Friday.*Instruction.*—At out-patient clinic. (Clinic founded in August, 1911. Its scope is curtailed from difficulty in obtaining beds).**Dublin: The Adelaide Hospital** (Ear and Throat Clinic).*Medical Officer.*—S. H. Law.*Beds.*—3 or 4. *In-patients*, 200 (approximate).*Out-patients.*—1800 (approximate). Tuesday, 10 a.m.*Operations.*—Wednesday, 9 a.m.*Instruction.*—Tuesday, 10 a.m.**Dublin: Mater Misericordiæ.***Medical Officers.*—P. Dempsey (*Ear and Throat*) and L. Werner (*Ear*).*Beds.*—*Ear*, 6. *Throat*, 8. *In-patients*, *Ear*, 80. *Throat*, 140.*Out-patients.*—*Ear*, 820. *Throat*, 1700. *Ear and Throat*, Tuesday and Friday, 9 a.m. *Ear*, Saturday, 9 a.m.*Operations.*—*Minor*, Monday and Thursday. *Major*, Wednesday and Saturday.

Dublin: National Children's Hospital (Ear and Throat Clinic).*Medical Officer.*—Sir Lambert H. Ormsby.*Beds.*—6. *In-patients*, 50.*Out-patients.*—1260. Four days a week, 11 a.m.*Operations.*—*Minor*, two days weekly. *Major*, Saturday, 12 noon.*Instruction.*—Saturday, 12 noon.*** Dublin: St. Vincent's Hospital and Dispensary.***Medical Officer.*—W. L. Murphy.**Dublin: Sir Patrick Dun's Hospital** (Ear and Throat Clinic).*Medical Officer.*—Sir Robert Woods.*Beds.*—7. *In-patients*, 80.*Out-patients.*—2000. Monday and Thursday, 10 a.m.*Operations.*—*Minor*, Monday and Thursday morning. *Major*, Tuesday, 9 a.m.*Instruction.*—Monday and Thursday, 10 a.m.

IRELAND: EYE, EAR AND THROAT CLINICS.

Belfast: Ophthalmic Institution—*Eye and Ear Hospital.**Medical Officers.*—J. Walton Browne, Cecil E. Shaw, H. H. B. Cunningham, W. McCready, and Rowland Hill.*Beds.*—6. *In-patients*, 50.*Out-patients.*—1000. Monday and Thursday, 10 a.m.*Operations.*—*Minor*, Monday, 11 a.m. *Major*, Thursday, 12 noon.*Instruction.*—Special lectures during the winter session on Wednesday, 5 p.m.**Belfast: Royal Victoria Hospital** (Eye, Ear and Throat Clinic).*Medical Officers.*—Jas. A. Craig and Henry Hanna.*Beds.*—8. *In-patients*, 215.*Out-patients.*—1100. Tuesday and Friday, 9 a.m.*Operations.*—*Minor* and *major*, Wednesday and Saturday.*Instruction.*—Tuesday and Friday.**Belfast: Ulster Eye, Ear and Throat Hospital.***Medical Officers.*—W. M. Killen, H. Hanna, and J. A. Davidson.*Beds.*—25. *In-patients*, 381.*Out-patients.*—2423. Monday, Tuesday, Thursday and Friday, 10.30 a.m.*Operations.*—*Minor*, Saturday, 10.30 a.m. *Major*, Wednesday, 10.30 a.m.**Belfast: Ulster Hospital for Women and Children** (Eye, Ear and Throat Clinic).*Medical Officer.*—H. H. B. Cunningham, and one vacancy.*Beds.*—3 to 5. *In-patients*, no record.*Out-patients.*—490. Tuesday and Friday, 9.30 a.m.*Operations.*—*Minor*, Friday morning. *Major*, as required.*Instruction.*—At out-patient clinic, besides clinical demonstrations at intervals. (Hospital recently re-built and accommodation for special clinic only now provided. Hence above statistics erroneous.)**Cork: The Eye, Ear and Throat Hospital.***Medical Officers.*—A. W. Sandford and T. H. D. Townsend.*Beds.*—35. *In-patients*, 650.

Out-patients—4000. Tuesday, Thursday and Friday, 12.30. (Ear and Throat.)

Operations.—*Minor*, daily. *Major*, Wednesday and Saturday.

Instruction.—At out-patient clinics. Also Wednesday and Friday, 5.30 p.m. Clinical demonstrations.

Dublin: Dr. Steevens' Hospital (Eye and Ear Clinic).

Medical Officer.—J. B. Storey.

Beds.—5. *In-patients*, 134.

Out-patients.—1246. Tuesday, Wednesday, Friday and Saturday, 10 a.m.

Operations.—As required.

Instruction.—At out-patient clinic.

* **Dublin: The Royal City of Dublin Hospital** (Eye, Ear and Throat Clinic).

Medical Officer.—A. H. Benson.

Dublin: Royal Victoria Eye and Ear Hospital.

Medical Officers.—J. B. Storey, P. Maxwell, L. Werner, T. O. Graham (throat), H. C. Mooney, F. C. Crawley and Miss E. Maxwell.

Beds.—82. Throat *nil*. Ear cases admitted but no special beds. *In-patients*.—487 (ear).

Out-patients.—2549 (ear). 228 (throat). Daily, 9 a.m.

Operations.—*Minor*, daily, 10 a.m. *Major*, daily, 10 a.m.

Instruction.—Daily, except Saturday, 11 30 a.m. ("New wing giving another twenty beds will be finished in October.")

Limerick: St. John's Hospital.

No organised clinic, but eye and ear work done "informally" by P. S. Pearse.

Londonderry: Eye, Ear and Throat Hospital.

Medical Officers.—W. B. Hunter, J. W. Killen and J. R. Magee.

Beds.—8. *In-patients*, 150.

Out-patients.—1650. Daily, 11 a.m.

Operations.—Every morning.

XVIIth INTERNATIONAL CONGRESS OF MEDICINE, LONDON, 1913.

Arrangements.

SECTION XV.—RHINOLOGY AND LARYNGOLOGY.

OFFICERS.—*President*: Sir StClair Thomson. *Vice-Presidents*: J. B. Ball, J. W. Bond, J. Dundas Grant, D. R. Paterson, Herbert Tilley, A. Logan Turner, P. Watson Williams, Gibb Wishart, R. H. Woods. *Council*: H. S. Barwell, F. W. Bennett, Adolf Bronner, J. W. Browne, H. J. Davis, J. Donelan, J. Walker Downie, G. William Hill, J. Middlemass Hunt, W. H. Kelson, H. Lambert Lack, W. Lamb, Greville Macdonald, John MacIntyre, W. J. C. Nourse, C. A. Parker, L. H. Pegler, W. Permewan, H. W. F. Powell, H. Betham Robinson, F. A. Rose, P. R. W. de Santi, Sir Felix Semon, E. B. Waggett, G. Wilkinson. *Secretaries*: Douglas Harner, A. Brown Kelly, Dan McKenzie.

SECTION XVI.—OTOLOGY.

OFFICERS.—*President*: Arthur Cheatle. *Vice-Presidents*: Thomas Barr, H. S. Birkett, Mark Howell, Edward Law, J. Kerr Love, William Milligan, Urban

Pritchard, Percy Webster. *Council*: J. Stoddart Barr, G. Nixon Biggs, J. McKenzie Booth, H. H. B. Cunningham, J. Gay French, Cecil Graham, Albert A. Gray, Thomas Guthrie, Somerville Hastings, Seecombe Hett, W. Jobson Horne, Hugh E. Jones, Richard Lake, H. J. Marriage, Frank Marsh, R. P. Mathers, W. M. Mollison, F. O'Kinealy, W. S. Syme, Hunter Tod, A. R. Tweedie, C. E. West, F. H. Westmacott, A. L. Whitehead, Macleod Yearsley. *Secretaries*: J. S. Fraser, G. J. Jenkins, Sydney Scott, Patrick Dempsey.

The Congress opens on August 6 and continues till August 13.

The morning sessions, beginning at 9.30 a.m., will be devoted to discussions. For details see *JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY*, May, 1913, p. 278. The reporters and readers of papers are allowed fifteen minutes and the subsequent speakers ten minutes for their remarks.

The afternoon sessions, beginning at 3 p.m., will be given up to independent papers. For details see separate programme.

A series of Clinical Demonstrations will be held in a room adjoining the Sections' meeting places, and several of the London Special Clinics have arranged for demonstrations of cases at their hospitals. *Secretary*: E. D. Davis, 81, Harley Street, W.

The Museum of the Section of Laryngology will occupy a special department of the General Congress Museum at the Imperial College of Science and Technology, Exhibition Road, S.W. See Museum Catalogue.

Committee: J. W. Bond (*Chairman*), A. Logan Turner, L. H. Pegler (*Curator*). *Acting Secretary*: Douglas Harmer, 45, Weymouth Street, London, W.

The Museum of the Section of Otology will be situated in a special room in the vicinity of the Sections' place of meeting (see separate notice).

Museum Committee: C. E. West (*Chairman*) A. A. Gray, H. J. Marriage, W. M. Mollison (*Secretary*), 48, Brook Street, Grosvenor Square, London, W. *Acting Secretary*: Sydney Scott, 130, Harley Street, London, W.

A series of entertainments has been arranged for under the Presidency of Prof. Urban Pritchard. For details apply *Secretaries of the Entertainments Committee*: H. J. Davis, 8, Portman Street, Portman Square, W., and Cecil Graham, 17, Upper Wimpole Street, W. *Treasurer*: Mr. Mark Hovell.

The Sections will meet at Rooms 20 and 21 of the Central Technical College, Exhibition Road, S.W. (near the Imperial Institute).

The *Office for Registration* for the Congress is situated at the Albert Hall, Kensington Gore, W.

BOOKS RECEIVED.

Geschichte der Ohrenheilkunde. Von Dr. Adam Politzer. Zwei Bände. II Band von 1850-1911. Mit 29 Bildnissen auf 29 Tafeln. Stuttgart: Verlag von Ferdinand Enke, 1913.

Text-book of Diseases of the Nose, Throat and Ear. For the Use of Students and General Practitioners. By Francis R. Packard, M.D. Second Edition, with 145 Illustrations. Philadelphia and London: J. B. Lippincott Co. Price 15s. net.

The Catarrhal and Suppurative Diseases of the Accessory Sinuses of the Nose. By Ross Hall Skillern, M.D. Philadelphia and London: J. B. Lippincott Co. Price 18s. net.

THE
JOURNAL OF LARYNGOLOGY,
RHINOLOGY AND OTOTOLOGY.

Original Articles are accepted on the condition that they have not previously been published elsewhere.

Twenty-five reprints are allowed each author. If more are required it is requested that this be stated when the article is first forwarded to this Journal. Such extra reprints will be charged to the author.

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**THE SIGNIFICANCE OF THE TONSILS AND THE SUPRA-
TONSILLAR FOSSA.**

BY D. R. PATERSON, M.D., M.R.C.P.,

Surgeon to the Ear, Nose and Throat Department, King Edward VII
Hospital, Cardiff.

RECENT discussion has brought up afresh the position of the tonsil in the animal organism, and we have once more in a larger form the old problem of what is best to be done for its simple hypertrophy. One result of medical inspection of schools has been to demand its more active treatment, if not complete removal. This renaissance of the tonsil question has not been confined, however, to this country, for the movement has been general, and there are few lands where laryngologists are not engaged in discussing the most effective procedure for getting rid of the gland, whilst conservative measures, which served their day in preserving some part of it, have been pushed into the background. Such being the case, it seems worth while to draw attention to certain points which throw light on the meaning of these organs with a view to inquiring if the place they fill in the economy is such as to justify a recourse to conservative measures which may enable them to retain it. For this purpose it will be necessary to refer to some points in their development, comparative anatomy and physiology, and as the palatal tonsil is the best known of the group and has in relation to it a space of some importance, the

supratonsillar fossa, with which I propose to deal, it will be convenient to begin with it.

The palatal tonsil arises in the second branchial cleft, the dorsal prolongation of which forms below the palate a groove—tonsillar sinus—and in this it is laid down. The sinus is clothed with a continuation of the mucous membrane of the mouth-cavity, consisting of stratified epithelium and young connective tissue. Into the latter there dip down processes of epithelium which develop a tree-like branching. These solid buds continue not only during the embryonic period but also in the first year of life. In the course of time they become hollow by the core softening and being expelled and the system of branching canals or crypts characteristic of the tonsil is established.

About the third month leucocytes appear in the connective tissue of the mucous membrane, changing the young fibrillary structure into adenoid tissue, and up to the time of birth this still preserves the form of a diffuse infiltration. Only later in the course of the first year of life does it proceed in close formation to the separation of true follicles with germ centres (Stöhr).

W. His was the first to trace back variability in the form of the adult tonsil to embryonic conditions, and it is only by a close study of those that a true appreciation of the organ can be arrived at. In this relation our knowledge has been considerably extended by Hammar. He has shown that in early embryonic life a projection—tonsillar tubercle—arises from the floor of the mouth and projects over the groove—sinus tonsillaris—converting it more or less into a sac. This tubercle soon flattens, becoming a fold—*plica triangularis* (His). This takes no part in the tonsil formation in man, though in the adult it may often be observed blending with the anterior palatal arch, its apex above becoming lost in the velum, its base disappearing in the root of the tongue.

Early in the middle of the third month the tonsillar sinus becomes divided by an ingrowing fold—intratonsillar fold—into two compartments. These, the tonsil recesses, lie the one above, and in front, the other below and behind. Each recess becomes the starting-point of a tonsil lobe, anterior superior and posterior inferior, and it is noteworthy that the former lobe is laid down somewhat earlier than the latter, and is during the greater part of embryonic life the larger of the two. In later foetal life, the intratonsillar fold retrogresses, the lobes amalgamate and an undivided sinus again results, the fold disappearing without taking any part in the lymphoid formation. The tonsillar tissue is con-

fined to the floor and outer wall of each recess, rarely involving the inner wall formed by the plica. This latter fold disappears completely or in part, and according as this takes place, it gives rise to variation in the naked-eye appearance of the tonsil. The whole plica may disappear and with it the tonsillar sinus as a space, leaving only as a remains the supratonsillar fossa. Where the plica persists in a more or less reduced state the sinus may be represented during life by a groove running along the anterior edge of the tonsil as well as by the supratonsillar fossa.

To appreciate the significance of these somewhat complicated changes it is necessary to look at the development of certain lower animal tonsils. That of the rabbit is essentially simple (Fig. 1, A). The tonsillar sinus formed by the remains of the second cleft is transformed into a sac by the growth of the tonsillar tubercle—*plica triangularis*. The lymphoid tissue is laid down all round this

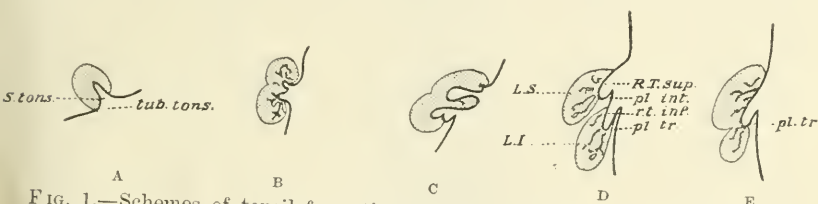


FIG. 1.—Schemes of tonsil formation in frontal section (after Hammar). A. Rabbit. B. Ox. C. Sheep. D. The more original condition in man. E. Fully developed tonsil in man. A is the primary form; the others the secondary showing also branching processes. S.tons. Tonsillar sinus. tub.tons. Tonsillar tubercle. L.S. Superior lobe. L.I. Inferior lobe. R.T.sup. Superior tonsil recess. r.t.inf. Inferior tonsil recess. pl.int. Intratonsillar fold. pl.tr. Plica triangularis.

pocket—that is, the tubercle or plica takes part in the formation of the tonsil. It is similar in the cat and the dog where the tubercle is well marked. In the pig there is a difference: the tubercle disappears early without taking part. In the ox and the sheep the tubercle also disappears, and an intratonsillar fold appearing later divides the sinus into two recesses and persists during life as a septum between the two lobes. In the sheep each recess opens separately on the surface. There are thus two forms, a *primary* where the tubercle comes into the development of the adenoid tissue (rabbit, cat, dog), and a *secondary* where a tubercle is formed, but disappears more or less early. The simplest variety of the secondary form is in the pig, where the sinus undergoes no modification beyond the growth down of epithelial processes to become the centre of the tonsil. In the others (ox, sheep, man) (Fig. 1, B, C, D) an intratonsillar fold appears as a new formation; in the first two species it is persistent through life, whilst in man

it is present only for a certain period in the embryo, and then completely disappears.

A further important difference between the primary and secondary form is an extensive development of epithelial prolongations in the latter. In the former they are entirely absent. Whilst the rabbit has a simple layer of lymphoid tissue lining the sinus, the cat and the dog show folds which suggests a transition stage, but it is only in the secondary that true prolongations are found, and they are especially marked in the ox, where they attain a tree-like branching.

This short account of the development of the tonsil shows an evolution from a simple to a more highly specialised form, and the changes which take place in man, following a well-known biological law, indicate what has occurred in the phylogeny. The simple lining of the sinus with lymphoid tissue is its primitive form, and in this form, as I shall show, it is associated with spaces and organs in process of retrogression. In man and the higher vertebrates it assumes later a more specialised rôle, and we shall see that in the fully developed organ these two forms exist side by side.

Lymphoid tissue shows a wide diffusion throughout the body, more especially in connection with the alimentary tract, where it is apparently associated with nutritive processes or the removal of tissue remnants. Examples of this may be found in the fore kidney of lower vertebrates, where lymphoid tissue appears around that disappearing organ. To take an instance from the amphibia lymphoid tissue laid down round rudimentary structures may be seen in the gills of the frog. Associated with the disappearance of the gills towards the end of the tadpole period of existence, large numbers of lymph-follicles form on the inner surface of the opercular membrane. The gills with the branchial cartilages become absorbed and the opercular cavity blocked up. Portions of the ventral ends of the gills persist even in the adult frog as a pair of soft lymphoid bodies lying at the side of the larynx, whilst remnants of the dorsal ends also stay for a time as a pair of soft lymphoid bodies immediately beneath the skin behind the ear (Milnes Marshall). According to Gaupp, the former, which persists in the adult, is to be regarded as a lymphoid organ producing lymph-cells, and as representing in certain relations the lymph glands of the mammalia which have no analogue in the frog. Thus lymphoid tissue, originally laid down in relation to a retrogressing structure, develops in the adult into a specialised organ.

We have again the almost constant presence of lymphoid tissue

in certain congenital cervical fistulæ formed by incomplete closure of branchial clefts. Kostanecki and Mielecki, after discussing those fistulæ in which an internal opening had been located, say: "The common factor in all these cases is that the inner opening is always either in the region of the tonsil, in the tonsillar sinus or in the palato-pharyngeal arch. . . . In each case the internal fistula opening falls in the region of the second branchial cleft." This statement is confirmed by Leegaard, who quotes five cases of his own in which the fistula opened in the region having its origin

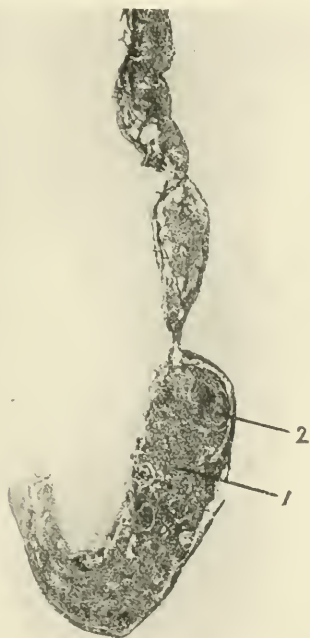


FIG. 2.—Photograph, $\times 10$. Section of wall of branchial cyst showing the lymphoid structure. 1. General lymphoid tissue. 2. Imperfect follicle.

in the second cleft. Levinstein recently recorded a case of incomplete internal branchial fistula where the opening was just in front of the anterior palatal arch. We owe to Leegaard a careful examination of twenty-three cases and a complete account of the microscopic structure of the fistula wall. In all a layer of lymphoid tissue was present under the mucosa, containing in many cases distinct lymph-nodules similar to those met in the tonsil, and this lymphoid layer was found practically throughout the length of the fistula track. In some cases of branchial cyst I found the wall infiltrated in places with lymphoid tissue having imperfect follicles

(Fig. 2), a condition which had been met by Hildebrandt in certain congenital branchial cysts.

The relationship is further illustrated by the presence of islands of cartilage in the tonsil area. Rückert found them in seventeen out of forty-eight tonsils examined in newly born and older children. They were confined to the fibrous tissue round the tonsil. Their occurrence may be explained by inclusion of parts of the second branchial cartilage, which had only partially retrogressed in the tonsillar structure.

If we turn to the pharyngeal tonsil, which is phylogenetically the oldest of the tonsils, being present in reptiles, birds and most mammals, we find it related to a vestigial space, the bursa pharyngea. This space has been shown by G. Killian to come into the region of the tonsil formation. Of its origin little definite is known. According to Linck the bursa pharyngea embryonalis belongs in its pure form to embryonic life. It is associated with the development of the chorda dorsalis. Its later fate in post-embryonic life in children and adults cannot be followed with certainty, as, owing to the development and extensive transformation which the pharyngeal tonsil and its neighbourhood undergo in a physiological and pathological sense a more or less comprehensive change of the bursa region takes place. It ought not to be confounded with the bursa pharyngea of some authors (Schwabach), which is a space in the centre of the pharyngeal tonsil produced chiefly by pathological changes and persisting often into adult life. It has also nothing to do with the hypophysis as was at one time supposed. Killian figures the first appearance of the lymphoid tissue on the roof of the naso-pharynx infiltrating the wall of the bursa.

The lingual tonsil is developed around mucous glands at the base of the tongue which appear in man in the fourth foetal month. It is only after complete development of these glands in the eighth foetal month that in connective tissue in the neighbourhood of the ducts a laying-down of round-cells takes place. A diffuse infiltration follows and the connective tissue assumes a reticular character. Later it leads to the formation of definite follicles, but even at five years of age these are not found in all the glands. As to the significance of this tonsil, it must be born in mind that the tongue in man has undergone complex changes before it emerged as the present muscular organ differing widely from the lower vertebrate tongue, which is largely glandular.

The appendix of the ventricle of the larynx represents the

vestigial remains of an air-sac, which is found in certain anthropomorphoid apes, and which sometimes persists in man as an extra-ventricular sac. Its formation indicates an organ differing from the main cavity of the ventricle. Whilst the latter forms a single space, the appendix has a complete system of small recesses and canals having at most a common opening. Adenoid tissue with actual nodules is found in many places in it. Citelli has shown that in normal conditions this adenoid tissue—laryngeal tonsil—is non-existent in the foetus, and only begins to appear in the first years of life, becoming evident towards the third or fourth year. After this it develops more and is maintained until the thirtieth year when retrogression sets in, which is marked by the fiftieth year. Like other tonsils it may present more or less hypertrophy. It is interesting to note that in this appendix, which represents a structure occurring late in the phylogeny, tonsillar tissue is not laid down until after embryonic life.

The vermiform process contains so large an amount of lymphoid tissue that Clado called it the *glandula appendicularis*, and recently Berry has put forward the view that the process is a specialised lymphoid organ. Like other retrogressing structures it is relatively larger in the embryo and newly born child. Its mucous membrane contains numerous lymphoid follicles. This tissue is developed in an organ in retrogression in man and undergoes changes similar to tonsillar tissue in other regions.

A noteworthy piece of what may be termed negative evidence showing the relation between the formation of a tonsil and a vestigial space is furnished by the rat. It is said that this animal as well as certain allied species has no palatal tonsil, and my own observations confirm this. I have examined carefully the mouth-cavity and pharynx of the brown rat in continuous serial sections, and no lymphoid tissue was noted until the region of the larynx was reached. The fauces was quite devoid of this tissue though well-developed mucous glands were present in large number. An explanation is furnished by Hammar, who examined rat embryos of various lengths. In none of the stages was any rudiment of tonsil present. The tonsillar sinus was altogether absent and no tubercle appeared. The non-appearance of the tonsil coincided with the absence of the vestigial space.

The palatal and pharyngeal tonsils may be regarded as the most highly developed form of lymphoid tissue. Only those two fulfil the conditions to which Bickel would apply the term "tonsil," viz. :
(a) A circumscribed form; (b) thick diffuse infiltration of the

connective tissue with lymph-cells together with a collection of special lymphoid follicles within those diffusely infiltrated areas ; (c) presence of crypts, *i. e.* branching depressions lined by epithelium of the surface into the lymphoid tissue, which is grouped round them ; (d) a large number of acinous mucous glands whose outlets pass through the lymphoid tissue and open mostly into the crypts. In the human subject, especially the child, a large number of mucous cavities do not separately open on the surface. In the interior are large single spaces into which several cavities open, whilst the common outlet is on the surface by a round or slit-like opening. The presence of these spaces or crypts has raised considerable controversy as to their meaning, but general opinion inclines to associate them with the mucous glands with which the parts about are richly supplied. Collections of peripheral lymphoid tissue are frequently met in the company of glands, and as Schaffer has pointed out, on the posterior pharyngeal wall in man every lymphoid collection is associated with a gland outlet. Lymphoid tissue is one of the most mobile in the body, having a predilection for places with favourable nutritional and space conditions. The difference between the palatal and the pharyngeal tonsil is incidental to their position. In the former are crypts, more or less closed branching canals ; in the latter clefts and folds. The site of the former, whilst exposing it to injury, enables it to bury itself in structures which protect it, and hence the necessity of closed spaces ; the latter, with no such need, is placed on a bony sub-structure where its development takes place surfacewards. The essential structure of both is, however, the same.

The developmental changes in the palatal tonsil, *viz.* the appearance of an intratonsillar fold which soon disappears after dividing for a time the tonsillar sinus into an upper and lower lobe, a condition persistent in the ox and sheep, afford strong presumption of a specialised structure. The upper part of the tonsil is the more primitive, the part in relation to the supratonsillar fossa, the remains of the second cleft. Hammar noted that the adenoid tissue of the upper lobe is laid down before the lower, and in his reconstruction model of the adult tonsil the upper lobe is confined to the upper pole of the tonsil and lies almost entirely within the soft palate. After birth growth takes place in the middle and lower parts, the upper showing very little development in comparison. This is more particularly noticeable in a hypertrophied tonsil at the end of the first year, when the enlarged mass is made up almost entirely of the middle and lower parts of the tonsil. As

pointed out by J. Killian, the portion of the tonsil which determines its characteristic form in the newborn is to be found in later life in the upper pole. All below that is secondary growth of the lower part of the original rudiment ("Anlage").

A similar change is seen in the pharyngeal tonsil, where a notable development of the lower part of the gland takes place after birth. About the end of the first decade the upper part of the gland is firm and crateriform, the lower soft and thrown into folds. The later development of this lower part explains the fact that the pharyngeal tonsil of man from the sixth embryonic month to the second decade moves out of the basisphenoidal into the basi-occipital region.

It will be noted that these tonsils may be arranged in the order of appearance in the embryo as follows: pharyngeal, palatal, lingual, and laryngeal. Their specialised development and their disappearance take place in the same order.

Each of these collections of lymphoid tissue is in the first instance laid down in relation to the vestigial space, and although it may undergo specialisation later part of it retains its primitive character. At a certain period of life the lymphoid tissue begins to disappear and the organ to undergo atrophy, the essential change consisting in the follicles and tissue as they disappear being replaced by connective tissue. A similar change takes place in the lymphatic glands, what Bezançon calls a "sclerose physiologique," in which the reticulum becomes thickened and fibrous, the follicles no longer contain germ centres and are less distinct, until in old age they disappear altogether, leaving little more than a mass of fibrous tissue. In the palatal tonsil of middle age this change is already well advanced, the tonsillar sinus is largely occupied by layers of fibrous tissue with a few islets of lymphoid structure (Fig. 3), and still later the supratonsillar fossa may be reduced to a groove or dimple. The oldest of the tonsils, the pharyngeal, shows the same change, only at a much earlier period, leaving a few grooves or a more or less definite depression surrounded by fibrous tissue at the top of the pharynx. Still later than either of those the same change is undergone by the tonsilla laryngis, which develops later. It is of interest to note that the onset of the change bears some relation to the appearance of the tonsil in the phylogeny. The earlier phylogenetically the tonsil appears, the earlier do atrophy and sclerosis set in. The sclerosis leads to what may be termed a normal involution of the space in which the lymphoid tissue is laid down, and it may be regarded as a means of protection from outward infection.

A similar change leads to the obliteration of the vermiform appendix. Ribbert regards this obliteration, so far as it occurs in the definite typical form, not as a pathological occurrence, but as a process of involution which corresponds to the significance of the appendix as an organ undergoing retrogression. The process of obliteration may be summed up according to Ribbert, as, simultaneously with or preceded by the disappearance of the lymphoid nodules and tissue, an overgrowth of connective tissue occurs.

In every such space there lies a disposition to disease due to its rudimentary character which favours bacterial growth and stag-

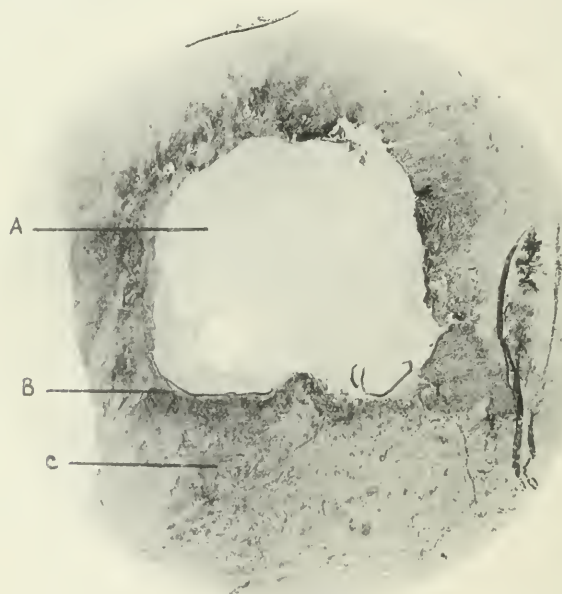


FIG. 3.—Photograph, $\times 10$.—Transverse section through the supratonsillar fossa of a man of fifty to show the changes in age. The ill-defined lymphoid tissue is confined to a small area around the lumen of the space, the main part of the section being made up of fibrous tissue. A. Cavity of the fossa. B. Remains of tonsillar tissue which is ill-defined; follicles have disappeared. C. Thick connective tissue which has replaced the lymphoid structure.

nation of contents, and it is a protective arrangement by which, in the first instance, the space in enveloped by lymphoid tissue, to be replaced later by a firm fibrous structure.

Before discussing the supratonsillar fossa and its relation to the palatal tonsil it will be convenient to say a few words about a structure which has received some attention of late, viz. the capsule of the tonsil, and for this purpose it will be necessary to refer to some points in its anatomy about which some misconception

exists. The tonsil on its outer aspect comes into relation with the intra-pharyngeal aponeurosis or fascia. This fibrous layer, very thick at the base of the skull to which it is attached, becomes thinner as it descends and is continued into the cellular tissue of the œsophagus. As pointed out by Descomps, it is this aponeurosis which forms in the faucial region the fibrous wall, concave internally, which lodges the tonsil, and is sometimes called the tonsillar capsule. It is at this point quite thick. On its internal aspect it may be strengthened by muscular fibres from the pillars of the fauces, whilst its external surface may receive fibres from the superior constrictor of the pharynx so that it may be fibro-muscular. Not infrequently, however, the constrictor is very thin or even deficient at this point, so that the peripharyngeal aponeurosis, lying outside it, may come into contact with the intrapharyngeal and the capsule is then a purely fibrous arrangement. It is worthy of note that, internal to the intrapharyngeal aponeurosis in this region, there lie the mucous membrane, tonsil and submucous muscles which form the pillars of the fauces. If the tonsil is pulled inwards its external aspect may be seen to adhere to the fibro-muscular capsule, which is pierced by vessels of supply fixing it to the tonsil. As age advances the reticular structure in the deeper part of the gland, owing to physiological sclerosis, becomes transformed into fibrous tissue and blends with the aponeurosis to form the thicker capsule of later life. Like the larva, which spins its own cocoon, the tonsil may be said to weave or at least add to its own capsule. Though anatomically in the first instance it does not belong to the tonsil the term "tonsillar capsule" is surgically convenient, inasmuch as after a time the fusion of the deep connective tissue of the gland with the aponeurosis is so intimate that it is impossible to separate them, and any operation for the complete removal of the tonsil must not only go outside the intrapharyngeal fascia, but sometimes take the peripharyngeal aponeurosis as well.

SUPRATONSILLAR FOSSA.

This space, the remains of the tonsillar sinus of the second branchial cleft, is, like all vestigial structures, somewhat variable, although its presence is very constant. I have already in papers published in 1898 dealt fully with its anatomical arrangement, and shown that its variation is due to the degree in which lymphoid tissue infiltrates it. An essential difference between the upper and lower parts of the tonsillar sinus is that the lymphoid tissue of the

latter is much more developed, more compact and fills out the sinus completely. In the former, part of the sinus persists as the supratonsillar fossa, the lymphoid formation being at once looser and more open, even taking the form of a network with separate strands distinct and well defined. In some specimens it is easy to evert the plica and palatal fold and expose the interior of the fossa, which may extend well over the upper part of the tonsil; large crypts open into it, and its soft lymphoid tissue differs from the firmer structure of the lower part. Most of the large crypts drain into this part, and it is a tendency to act as a cesspool which gives it



FIG. 4.—Photograph, $\times 25$.—Transverse section through supratonsillar fossa, which was lightly packed with cotton-wool before hardening. A. Fossa. B. Its anterior wall, in the greater part of which tonsillar tissue is entirely absent. The epithelium is well developed and lies directly on the connective tissue of the palate.

importance in inflammatory affections. Where its wall is thickly infiltrated with lymphoid tissue it has received the name of Tortual's sinus. On the other hand, the infiltration may be more thinly laid down and even in places deficient, so that gaps exist, the significance of which I shall allude to directly.

This latter form of fossa is, as J. Killian well puts it, a persistence of the uppermost part of the tonsillar sinus in its condition at birth where the mucous membrane itself, and especially the lateral fold of the plica, remain free from much lymphoid infiltration. To

determine the disposition of the lymphoid tissue in the fossa wall I have examined a large number of tonsils. Specimens taken by operation and from the post-mortem room were hardened, the fossa in some being lightly filled with cotton-wool so as to show the outline better. Horizontal and vertical sections were made through the upper part. Great variability in the amount of adenoid tissue in the anterior and upper section of the wall of the fossa was noted. Some specimens showed considerable lymphoid infiltration, others only a more or less thin lining, and this latter form received special attention. Even when the lymphoid tissue generally was much developed the anterior part of the wall exhibited a striking resemblance to the condition met in branchial fistulæ, where, under the mucous membrane, a lymphoid layer of variable thickness is always present. This points to the primitive character of the fossa wall, a comparison with a fistula being further borne out by specimens in which the lymphoid lining is very thin and in places absent. In these, at certain points the mucous membrane lies in direct contact with the cellular tissue beneath and the gap extends over a not inconsiderable area. These gaps are always in relation to the upper and anterior part of the space, directly behind the anterior pillar and the adjacent part of the palate. Over the greater part of the fossa the epithelium is well developed and remains free from infiltration—a condition more marked on the anterior wall.

In Fig. 4 a transverse section displays a considerable area of the wall quite free from tonsillar tissue, the mucous membrane being in contact with the cellular tissue of the anterior aspect of the palate. The other illustrations (Figs. 5, 6, 7, 8) exemplify similar points, and I am indebted to Dr. Barton White for the photographs.

On the other hand, Fig. 3 shows the changes produced by age, the section exhibiting atrophy of the lymphoid tissue with a thick fibrous ring round. I have seen a specimen where the lymphoid tissue had entirely vanished, leaving a well-marked space filled with calcareous and other particles.

In a former paper I pointed out that the disposition of the plica triangularis affects the fossa at its anterior part, and I have already mentioned Hammar's view that whilst in some of the lower vertebrates this fold takes part in the tonsil formation, in man it does not, but is a retrogressing structure. This supplies a key to its great variation and in part explains the variability of the anterior wall of the fossa just noted.

Let us now see how those dispositions help to explain the origin of certain tonsillar affections. Even when much tonsil hypertrophy

is present the lymphoid tissue around the anterior aspect of the fossa takes little or no part in the enlargement. The specialised part of the gland is then mainly affected, the crypts of which, opening into the fossa and shedding their products into it, render it a starting-point of infection. The significance of this is manifest when it is recalled that lymphoid tissue in the palatal tonsil begins to retrogress about the fifteenth year. Up to then it is in full activity, able to resist the entrance into the deeper tissues of infection which may lurk in the fossa. Up to that time



FIG. 5.—Photograph, $\times 7$. Sagittal section of upper part of tonsil, the supratonsillar fossa of which was lightly filled with cotton-wool before hardening. A. Supra-tonsillar fossa. B. Its anterior wall.

from the fifth year, tonsillar affections are mainly those of the gland proper, the crypts and lacunæ being the seat of disease, the infective agents entering the gland tissues by way of the crypts. After that, infection of the peritonsillar tissue begins to manifest itself. The age of incidence of simple hypertrophy, 5–15, is not the age of peritonsillitis, 15–35. What is the reason? By fifteen the activity of the gland begins to wane, physiological sclerosis sets, hardening the tissues and throwing up a barrier to further infection. The thicker the adenoid tissue the stronger the fibrous barrier which replaces it. Where it has been thin or absent as in the fossa little or no fibrous layer is produced, and septic secretions

from the crypts collected in the cesspool find a gap in the anterior wall through which they infect the peritonsillar tissue. In 98 per cent. of cases, peritonsillitis starts at this point around the upper and outer aspect of the tonsil, the infective agent going through the wall into the areolar tissue of the soft palate and spreading through it, limited only by the intra-pharyngeal aponeurosis. In other infections, such as scarlet fever, necrotic changes may affect the thin anterior wall of the fossa, leading to perforation in the neighbourhood of the anterior pillar and not infrequently permanent



FIG. 6.—Photograph, $\times 7$. Section in transverse plane of the same specimen as Fig. 5. A. Supratonsillar fossa. B. Its anterior wall showing lymphoid tissue in varying thickness.

fenestration. Examining such cases it may be seen that the fenestrated anterior wall is often extremely thin and practically devoid of adenoid tissue. Similar changes I have seen in cases of tertiary syphilis of the pharynx. Recently, in two patients showing syphilitic scarring in the pharynx one could inspect through a fenestration the fossa with perfectly smooth wall, having no trace of lymphoid tissue, and below it an apparently healthy tonsil.

Winckler holds that peritonsillar infection is due to defect in the capsule through which adenoid tissue pushes itself, and in this way carries infection to the deeper tissue. It is difficult, however,

to realise how this occurs at a time when the capsule is already becoming thick and more fibrous.

With regard to the treatment of affections of the tonsil it is essential to bear in mind the composition of that structure, made up as it is of two parts, fossa and gland proper, each associated with affections which usually occur at different periods of life. Though distinct those parts are closely associated from the fact that a large number of the crypts drain their contents by way of the fossa. Experience has shown that improving this drainage by



FIG. 7.—Photograph, $\times 7$. Transverse section through supratonsillar fossa.
A. Cavity of fossa. B. Its anterior wall, showing irregularity in amount of lymphoid tissue.

opening out the fossa leads to cessation of the crypt infection and return of the gland to a healthy condition. The comparative freedom from such affections of the neighbouring lingual tonsil, though it occupies an exposed situation, is in great part explained by the absence of such a space as the fossa, and the same may be said of the pharyngeal tonsil. Affection of one part of the palatal tonsil may take place independently of the other, and its appropriate treatment may be carried out without sacrificing the whole gland. The palatal tonsil is too often regarded as a homogeneous organ, a view which seems to be the basis of the drastic treatment which aims at sweeping it away, not always with due

regard to its place in the animal economy. That it has a very definite function is evidenced by the changes it passes through in development. These cannot be dismissed as without meaning and useless. Rather do they speak against its sacrifice unless for very good reason, and surely it is more rational to aim at the restoration of an organ to a healthy state than its complete removal.

In a former paper I pointed out that in treatment of the fossa the primary consideration is to open out the space and drain it, and that the removal of the upper pole of the tonsil fulfils this

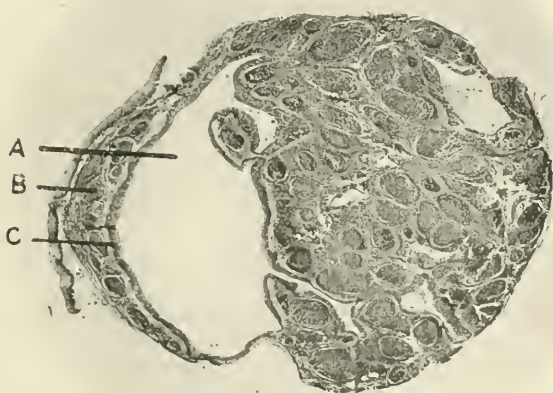


FIG. 8.—Photograph, $\times 7$. Transverse section of supratonsillar fossa a short distance above the outlet to show the well-developed mucous membrane lining it. A. Cavity of fossa. B. Anterior wall. C. Well-developed mucous lining.

indication. This has been confirmed by subsequent experience, for the lower part of the tonsil usually becomes healthy and resumes its function. Even removal of the upper pole is not always necessary. Rosenberg has called attention to a procedure which has been carried out in Hinsberg's clinic for over two years—that of slitting up the fossa by passing a bistoury along it and cutting across the anterior pillar. By treating it in this manner like a fistula an admirable view is obtained of the interior as the edges spring widely apart. Limited disease can be dealt with, and where necessary removal of the gland can be more readily carried out. The injury to the anterior pillar causes little or no inconvenience

as the parts soon granulate up and leave very little scar. Finally, there is the still more conservative treatment of brushing or washing out the fossa and crypts—an old method which is now being largely used on the Continent.

The palatal tonsil, which I have taken as the best example of the group, has, as we have seen, lymphoid tissue appearing at two different periods, an upper part retaining more or less its primitive character, and a lower, which may be regarded as the gland proper. With regard to the latter no one has yet given any cogent reason why its function should be regarded as different from that of other lymphoid structures, viz. to form leucocytes. In whatever position lymphoid tissue is met, *e. g.* tonsils, thymus, spleen, lymph-glands, it has always the same structure, though some may be more specialised. In the pharyngeal cavities of vertebrates it shows a wide diffusion, in some places forming large organs, tonsils, which may be regarded as the highest developmental form, in others it is more spread out, as in the lingual tonsil, possessing interspersed germ centres without close aggregation of mucous glands, whilst in still others it is a simple diffuse infiltration of the connective tissue without nodular masses. We know that the chief activity of the tonsils falls in early age when the whole lymphatic apparatus is involved, at a time when the thymus is slowly disappearing, and its place is taken by their activity. The view that tonsils are retrogressive structures, useless and even injurious in the economy and therefore to be pursued with "fire and sword," is founded on a misconception of what we have seen occurs in the ontogeny, viz. that lymphoid tissue laid down in the first instance in vestigial spaces may at a later period be called upon to assume another and important function—the formation of leucocytes for the use of the organism—and to this end is specialised to form distinct organs. The contention of Berry that the appendix is a special lymph organ does not exclude, as he assumes, the view that its lymphoid tissue is primarily laid down in a retrogressing structure; on the contrary, as we have seen, the association of the two is not uncommon. The appearance of tonsils in connection with retrogressing structures at different periods in the ontogeny coincides with the general scheme of the haemopoietic system, in which all parts are not in full activity at the same time, but replace each other in the course of development, as may be seen from the different periods at which the tonsils come into full activity. It is probable that most leucocytes are agents of absorption either in the service of nutrition, or destined for the removal of tissue remains

which are in part or complete retrogression. It is also probable that this process, originally serving only such removal, develops a further use, so that eventually by a change of function it subserves other purposes than the original, and by so doing preserves itself longer.

It is not within the scope of this paper to notice various theories which have been advanced to explain the meaning of the tonsils. We have dealt only with considerations which show that they have an essential function in the body, and that treatment, designed to preserve them whole or in part so as to enable them again to fulfil it, is based on rational lines.

BIBLIOGRAPHY.

- BERRY.—*Journ. Anat. and Physiol.*, vol. xl.
 BEZANCON.—Cornil and Ranvier's "Manuel d'Histologie Pathologique," vol. iii, 1907.
 BICKEL.—*Virchow's Archiv*, 97, 1884.
 CLADO.—*Comptes Rendus*, 1892.
 CITELLI, S.—*Anat. Anzeig.*, Bd. xxix, 1906.
 DESCOMPS.—*Thèse de Paris*, 1908.
 GAUPP.—Ecker u. Wiedersheim's "Anat. des Frosches."
 HAMMAR, J. AUG.—*Arch. f. Mikroskop. Anat.*, Bd. lxi.
 HILDEBRANDT.—*Langenbeck's Arch.*, Bd. xlix.
 HIS, W.—"Anat. Menschlichen Embryonen": iii, "Zur Geschichte der Organe."
 KILLIAN, G.—*Morph. Jahrb.*, Bd. xiv, 1898.
 KILLIAN, J.—*Arch. f. Laryngol. u. Rhinol.*, Bd. vii, 1898.
 KOSTANECKI AND MIELECKI.—*Virchow's Arch.*, 120 and 121, 1890.
 LEEGAARD.—*Arch. f. Laryngol.*, Bd. xxvi, Heft 1.
 LEVINSTEIN.—*Arch. f. Laryngol.*, Bd. xxiii.
 LINCK.—*Zeitschr. f. Ohrenheilk.*, Bd. lxii.
 MARSHALL, MILNES.—"Vertebrate Embryology."
 PATERSON, D. R.—*Proc. Laryng. Soc. London*, February, 1898; *Journ. of Laryngology*, April, 1898; *The Laryngoscope*, July, 1898.
 RIBBERT.—*Virchow's Arch.*, 132, 1893.
 ROSENBERG, W.—*Zeit. f. Ohrenheilk.*, Bd. lxxvii, Heft 1 and 2.
 RUCKERT, A.—*Virchow's Arch.*, 177, 1904.
 STÖHR, P.—*Anat. Anzeig.*, 1891.
 WINCKLER.—*Verhandlung. III, Inter. Laryngo. Rhinol. Congress*, 1911.

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ERYSIPELAS FOLLOWING THE RADICAL MASTOID
OPERATION.

By J. S. FRASER, M.B., F.R.C.S.E.,
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THE difficulty of making a diagnosis in cases of suspected intra-cranial complication following the radical mastoid operation is well known. The differential diagnosis must usually be made between extra-dural abscess, meningitis, septic infection of the venous sinuses (pyæmia and septicæmia), and abscess of the temporo-sphenoidal lobe or cerebellum. In the *Zeitschr. f. Ohrenheilk.* (Bd. lxiv, Heft 1, 1911), Ruttin calls attention to the symptoms which arise in cases of erysipelas following the mastoid operation. He points out that the fear of erysipelas as a result of the operation is always present, and that, in the early stages, the symptoms are difficult to diagnose from intra-cranial complications (meningitis, brain abscess, and venous infection), as severe headaches, tenderness on pressure, high temperature and slight stiffness of the neck may be already present before one can recognise with certainty the erysipelatous blush on the skin. Ruttin has also called attention to an early and important sign of post-operative erysipelas—spontaneous nystagmus on lateral deviation of the eyes.

Ruttin's first case was operated upon for chronic middle-ear suppuration, labyrinth fistula, and subsequent acute labyrinthitis. At the operation the oval window was empty and the promontory softened. For seven days all went well, but on the eighth day the temperature went up slightly, and then came down again. On the tenth day sudden high temperature occurred with headache and *nystagmus to the diseased side*. This could only be of retro-labyrinthine origin, as the labyrinth had already been destroyed by operation. The nystagmus might, therefore, be due to cerebellar abscess or to meningitis (serous or purulent). Ruttin's first thought was of meningitis, as he had already lost one case through this complication, which came on about six days after the labyrinth operation. Cerebellar abscess, on the other hand, shows itself much sooner after the radical operation, and, further, no signs pointing

to cerebellar abscess had been discovered at the operation. To exclude meningitis he performed lumbar puncture, but with negative result. The nystagmus became extreme in every direction—a condition often met with in cases of abscess, tumour and basal meningitis. Only after four days of fever, headache and nystagmus did the skin begin to show any signs of erysipelas: by this time the nystagmus and headache had diminished greatly. On the following day the erysipelas was fully developed, whereas the nystagmus and headache had disappeared. Ruttin believes that in this case the nystagmus was so marked because the labyrinth operation (Neumann) had been performed, and the dura of the posterior fossa had, therefore, been exposed. For this reason hyperæmia and œdema could affect the posterior fossa and give rise to the symptoms of meningitis. He says that it is not remarkable that they had previously missed such cases because they had always sent away their patients with erysipelas to the fever hospital.

Five other cases are given, the last of which was reported by Neumann, and is especially interesting. The patient had suffered from chronic middle-ear suppuration for fifteen years. The whisper was heard at one and a half metres; Rinne negative; vestibular apparatus normal. On the fifth day after the radical operation the temperature rose to 39.8° C., with giddiness, vomiting and nystagmus to the sound side; the patient was found to be deaf for speech and tuning-forks, and the vestibular excitability was lost. Post-operative labyrinthitis was thought of, but the high temperature did not agree with this. Further, there were no signs of venous thrombosis or of meningitis. Neumann adopted a waiting attitude, and two days later erysipelas appeared. After this had passed off it was, however, found that the functions of the labyrinth had been lost.

Ruttin believes that spontaneous nystagmus, on looking to the side, is a common symptom of post-operative erysipelas. This nystagmus may be due to serous labyrinthitis, but is more probably due to intra-cranial causes. The direction and intensity of the nystagmus vary. The nystagmus may occur (1) along with fever and headache before the skin becomes red, or (2) it may accompany the erysipelas. The nystagmus disappears before the fall of the temperature or along with it. The total duration of the nystagmus only amounts to a few days. Return of erysipelas may be indicated by a fresh occurrence of nystagmus.

Until recently the writer has had no experience of erysipelas

following the mastoid operation, and has, therefore, had no opportunity of confirming the observations of Ruttin. The following case, however, is of interest in this connection:

E. McD —, female, aged fourteen, was seen on March 4, 1913. She complained of discharge from the *right ear* of two years' duration; for two days she had suffered from pain in the right ear which prevented sleep; no giddiness or vomiting.

On examination, the left tympanic membrane showed a retracted oval scar posteriorly. The right external meatus contained foul-smelling pus; after syringing, a pale mass of granulations was seen projecting into the meatus from the posterior superior part of the tympanum. The tympanic membrane could not be seen. There was tenderness on pressure over the mastoid. The *conversation voice* was heard by the right ear at 10 in., and by the left ear at 3 ft. The watch was heard on both mastoid processes and by air-conduction at 1 in. on the right side and at 4 in. on the left side. Schwabach lengthened. Rinne negative right ear. Weber to right (worse ear). With the noise apparatus in left ear she could hear the conversation voice at 6 in. by right ear.

In view of the retention of function by the cochlea it was unfortunately not thought necessary to test the vestibular apparatus before operation. No note as to spontaneous nystagmus.

The patient was at once admitted, and it was found that her evening temperature was 103° F.; pulse 120. The patient's head was in a bad condition; pediculosis and impetigo were present, especially over the right temporal and parietal region, but there was no noticeable redness or swelling over the mastoid. A paraffin soak was applied to the head, and the mastoid region prepared with iodine in the usual way.

March 5, 1913: Radical mastoid operation (J. S. F.). Usual curved incision in hair margin. Cortex normal; very profuse bleeding from posterior part of bony cavity in region of sigmoid sinus; sinus not exposed. Dura of middle fossa exposed and found healthy. Lining membrane of antrum swollen and congested; antral cavity contained pus; malleus and incus removed and found normal. Tympanic mucosa red and swollen; Eustachian tube curetted; Koerner flap cut; cavity swabbed out with peroxide of hydrogen and packed with bismuth gauze. Nothing was found at operation to account for the high temperature. Temperature again 103° on night of operation.

March 6: Patient slept badly; vomiting present; patient complains to-day of pain at back of head; slight Kernig. Slight horizontal nystagmus to right (diseased side). No nystagmus on looking straight forward or to left. Urotropine given—5 gr. every four hours. Temperature 99.8° at 8 a.m.; 101.8° at 8 p.m.

March 7: Temperature 99° a.m. Nystagmus as before; vomiting occasionally; knee-jerks exaggerated; abdominal reflexes present; flexor response to Babinski's test. *Kernig's sign* absent to-day. No retraction of head. Slight tenderness on pressure over cervical vertebrae. Tongue furred but moist. No abdominal swelling or tenderness. Wound dressed; some redness of skin around incision, which, however, appears to be healing. Operation cavity looks satisfactory. Temperature 101.4° at 8 p.m. Pulse 108.

March 8: Temperature 98.2°. Girl seems to be bright, sits up in bed and says she feels well. Evening temperature 104.2°. Pulse 108.

March 9: Girl looks well. Temperature 101° at 8 a.m.; tongue moist. No pain on pressure on eyeballs; no photophobia. She can bend head forwards and shake it. Still slight tenderness over cervical spine. *Nystagmus disappeared*.

Kernig absent; knee-jerks still a little exaggerated. No ankle clonus; no ocular paralysis, no facial paralysis; no rigors or cold feeling. Blood culture from arm vein showed only *Staphylococcus albus*—probably a skin contamination.

Wound dressed; cavity again shows satisfactory reaction; redness of skin around incision continues. Temperature 103° at 8 p.m. Pulse 104.

March 10: To-day for first time (five days after operation) oedema and redness of right eyelids. (Note made: Is case merely one of erysipelas?)

Again slight nystagmus to right. Temperature 101.6° this morning. Pulse 100. Girl sleeps very well; no rigors. She does not take her food very well, but no vomiting. Temperature 104.6° at 8 p.m. Pulse 116.

March 11: Temperature down to 99° this morning. Patient has had a good night; she does not appear nearly so ill as temperature suggests. (Edema and redness have now passed over to left eye, which is quite closed. Iodine paint applied. Girl has red blotches on face, and one bleb containing fluid on forehead near hair margin (culture showed *Staphylococcus albus*—contamination?). She sits up in bed and talks to the other children. Tongue moist. Wound dressed—all stitches removed, incision healed. No vomiting. Temperature 102° at 8 p.m. Pulse 104. March 12: Temperature 100° – 103° . Left eyelid still swollen. Operation cavity granulating well. March 14: Temperature suddenly dropped from 103° to 97.4° . Pulse from 102 to 84. March 17: Temperature rose to 100° on March 15 and 16; to-day it is 97.6° . She takes food well. Wound satisfactory.

March 21: No swelling of face now. Temperature normal. Ear cavity rather dirty.

Dr. Norman Walker saw the patient to-day, and stated that the scalp lesions were due to impetigo, and that the erysipelas of face had probably spread from them. March 24: Posterior wound has broken down for a short distance about centre; ear cavity still discharging freely.

April 6: Temperature has been normal since March 17. Whisper right ear at 1 ft.; conversation voice 3 ft. (10 in. before operation). Inner wall of cavity—easily seen through enlarged meatus—is covered by smooth layer of granulations. Epithelium spreading well. No spontaneous nystagmus. Cold syringing right (operated) ear produces nystagmus to left in 12 seconds.

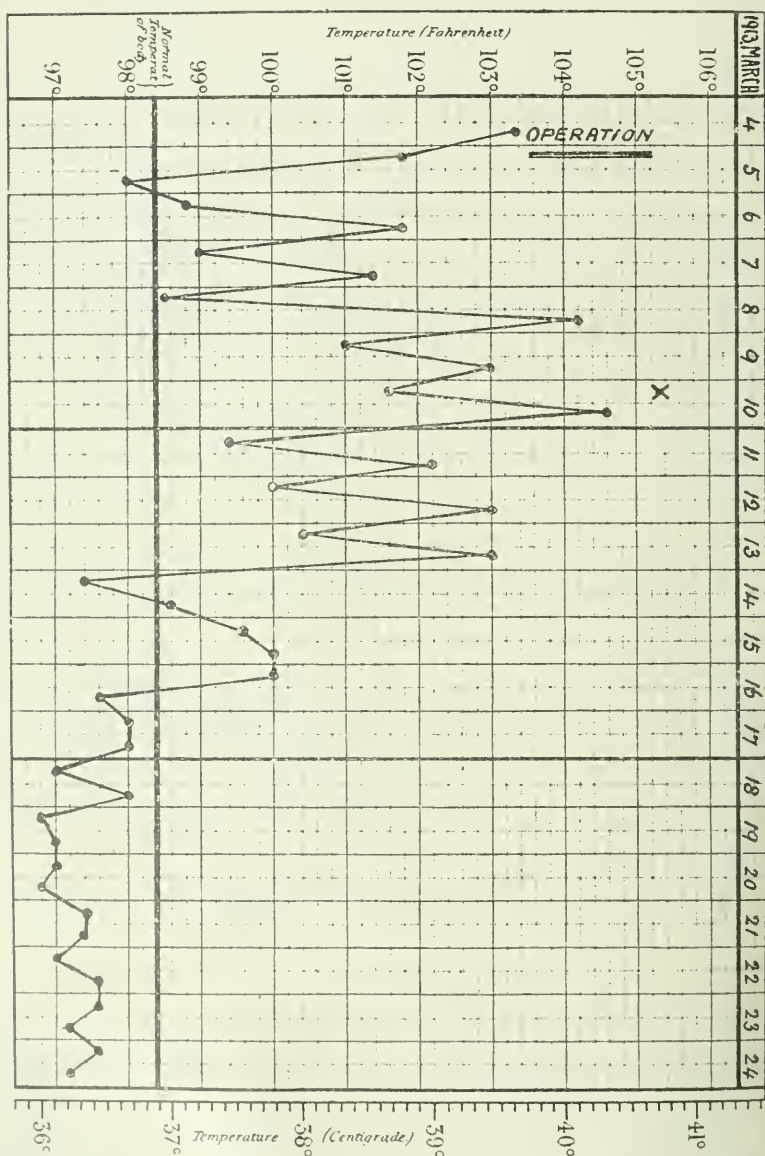
April 18: Ear not quite dry yet. Whisper at about a foot right ear. Very slight spontaneous nystagmus in both directions, not more than is often seen in normal persons.

April 29: Still hears raised whisper at a foot. Less discharge is coming away now when ear is syringed. Still some moisture in posterior part of wound cavity

REMARKS.

Up to the time of the appearance of erysipelas the case was very puzzling. Like Ruttin, the writer thought first of all of meningitis and septic infection of the venous sinuses. The signs and symptoms of a mild meningitis (meningismus) were undoubtedly present for two days after operation, but already on the latter of these days the signs were much less marked, and for this reason lumbar puncture was not performed. The writer has always been somewhat afraid of performing lumbar puncture in cases where the signs of meningitis were not well marked. The danger of con-

verting a localised into a general lepto-meningitis appears to him to be a very real one. The bacteriological examination of the



blood on March 9 showed only the *Staphylococcus albus*—probably a skin contamination. It is interesting that the fluid removed by aspirating the erysipelatous blister on the forehead also showed the same contaminating organism. The writer regrets that no

note was made as to the presence or absence of spontaneous nystagmus before operation, and further, that the vestibular apparatus was not tested, but, in view of the tuning-fork and hearing tests in the right ear (conversation voice at 6 in. with noise apparatus), labyrinthitis was almost certainly out of the question. The patient looked so well in the waiting-room that the temperature was not immediately taken, and it was only on the morning of operation that it was discovered that the temperature had been 103° F. on the night of admission. The precise site and origin of the erysipelas was rather hard to determine, but, as the mastoid cortex was normal, it is probable that the inflammation of the skin originated from the condition of the scalp. It is also a pity that no swab was taken from the pus in the antrum. The hæmorrhage from the bone overlying the sigmoid sinus was so free as greatly to interfere with the operation; for this reason the sinus was not exposed. After operation, the patient, though ill, did not look like a case of meningitis or sinus infection. She was bright, answered questions readily and the headache was not severe. In the writer's experience slight nystagmus to the sound side is not uncommon for a few days after the radical mastoid operation, and may possibly be accounted for by slight serous labyrinthitis, but marked nystagmus to the side of operation has not previously been observed by the present writer in the absence of serious intracranial trouble. By March 9 (fourth day after operation) the nystagmus had disappeared and all signs of meningitis were absent; only on the following day did the erysipelas of the face appear. All through the wound did very well; the incision healed by first intention and the mastoid cavity granulated quickly and evenly. Rutin suggests two possible causes for the nystagmus: (1) Serous labyrinthitis, and (2) some inflammatory irritation in the posterior fossa. In the present case it is almost certain that an inflammatory condition was present in the posterior fossa for a few days after operation, as evidenced by the presence of headache, vomiting, stiffness of the neck, nystagmus and Kernig's sign. On the other hand, the nystagmus present (first degree to the diseased side) did not correspond in direction or degree to that associated with the presence of labyrinthitis. Further, the examination of the right ear one month after operation showed that the hearing had considerably improved and that the vestibular response to cold syringing was exceedingly prompt. While this does not absolutely exclude the previous presence of serous or circumscribed labyrinthitis, the writer is inclined to attribute the post-operative

symptoms to an inflammatory condition at the base of the brain (localised meningitis) and not to labyrinthine disease.

In conclusion the writer wishes to acknowledge his indebtedness to Dr. Logan Turner for permission to record this case.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE.—OTOLOGICAL SECTION.

April 18, 1913.

DR. J. DUNDAS GRANT, *President of the Section, in the Chair.*

Abridged Report.

Discussion on Functional and Simulated Affections of the Auditory Apparatus.—Opened by **T. Mark Hovell, F.R.C.S.**—A discussion on this subject is needed, for the knowledge relating to this class of disorder appears to be more rudimentary, and appropriate treatment less clearly defined, than in connection with most other aural affections. The looseness of the phraseology in describing the disease is an indication that it has not received serious attention. It is often called "functional deafness," and the term "hysterical" in connection with it is frequent.

Granular pharyngitis is frequently caused by displacement of the uterus, as proved by the granulations disappearing without treatment when the womb is replaced in its normal position, but the affection is nevertheless properly called granular pharyngitis, as it is also produced by many other causes. The term "hysterical," however, frequently occurs in connection with the subject under discussion, and the term "hysterical paralysis of the auditory nerve" is also used, which, taken literally, is farcical.

Cases of the description under discussion most frequently occur in those individuals who wish to be exempted from military service or who hope to obtain pecuniary advantage. There are, however, cases in which the hearing power appears to be suppressed as the result of a violent emotional influence, and others in which deafness is simulated without an apparent object, or in which the loss of hearing power cannot be explained otherwise than by a temporary want of the necessary nerve power or stimulus.

Sir William Dalby related a case in which a girl, aged seventeen, came down in the morning apparently totally deaf, although from the unaltered modulations of her voice he felt certain that she possessed hearing power. Six months later she came down to breakfast hearing quite well.

Dr. Ransom¹ mentions the case of a miner, aged nineteen, who awoke apparently unable to hear or utter a sound. He gave no sign when

¹ *Brit. Med. Journ.*, March 2, 1905.

a cannon was fired close to him. He neither talked, whispered, nor uttered any inarticulate noises. His intellectual faculties were unimpaired, and he communicated by reading and writing. Otherwise his general condition seemed normal. He promptly did whatever he was told to do in writing, except that apparently he could not repeat a word spoken to him or read aloud what he clearly understood or had himself written. Moderate pain did not produce any cry. A fortnight later, the symptoms having remained unchanged, he showed also anæsthesia of the palate and loss of the palate reflex. A faradic current was sent through the larynx by means of intra-laryngeal an electrode and one on the front of the neck, the result being a kick and a yell. He was then told he could speak, and at once answered, "Yes, I can." The next morning he could answer questions uttered in a whisper. He went home hearing and speaking normally after having been deaf and dumb for five weeks. Charcot points out that the character of the deafness was quite unlike that of a malingerer, for he never started at the slightest noise made unexpectedly behind his back, whereas he did seem occasionally to comprehend simple orders made before his face, such orders being those that the doctor might be expected to give. A malingerer would have done the reverse. He also states that a malingerer would probable not feign loss of speech as well as loss of hearing, and anæsthesia of the palate could not be counterfeited by one ignorant of the symptoms of organic disease.

In another case mentioned by Dr. Van Dyck,¹ which occurred in a lad, aged nineteen, there was a history of masturbation. In this case it was stated that it had been noticed that the hearing had been apparently dull and that he had been unusually silent for the last two or three days, also that the deafness and speechlessness had been variable but had on the whole increased, until towards the close of the day in question it was found impossible to make the boy utter a sound or give evidence of hearing anything. He made hardly any attempt to communicate with anyone by signs or gestures, until when some words written proved illegible he would point to them and shake his head. He paid no heed to a loud shout and a sharp whistle or banging noise behind him, and wrote that he heard nothing. When the request was made by Dr. Van Dyck to a bystander in an ordinary tone of voice to have a bo'sun's whistle blown behind the boy's back suddenly, and he was asked after it had been done whether he had heard anything, he wrote, "I hear something like a whistle." Telling him to walk across the room, Dr. Van Dyck called loudly, "Now come back," expecting that one of the men standing by would turn him, but he turned of his own accord, and another order loudly and clearly uttered was promptly obeyed. Dr. Van Dyck now remarked in a loudish tone "You hear me now," and the boy nodded. When asked his name he shook his head, and when asked to say one, two and three, he opened his mouth and made two or three feeble and utterly soundless efforts, and then shook his head again. When told to say "ah," after an apparent effort he got out a whispered and only just audible "ah," and with other words merely produced a sort of whispered stutter. When seen the next day he was hearing and speaking normally.

Here is the case of a lad who gradually becomes less and less attentive to what is said to him, and who exhibits a diminishing effort to converse with those around him. May not this condition be due to an exhausted nervous system, not actually to deafness, but to blunted sensibility from nerve exhaustion, with no fixed wish to deceive, but an exaggerated condition of what most of us would feel when extremely tired, a feeling

¹ *Ibid.*, May 4, 1905.

that one cannot be bothered to give the necessary attention to a matter, and that it must either wait or go?

In dealing with a case of simulated deafness, care must be taken not to be prejudiced by statements made by persons associated with the patient, and in all cases in which there is no apparent motive for loss of hearing it is desirable to remove the patient from uncongenial surroundings. It must not be forgotten that in a large number of the cases in which deafness is simulated for advantage, there is a history of well-established impairment of hearing in one or both ears, and an examination clearly shows old-standing disease. The deafness therefore simulated is merely an additional degree.

In many cases of simulated deafness onset is sudden, and is stated to be discovered whilst the patient is alone, as on awaking in the morning. The modulations of the voice remain unaltered, and there is an absence of the quick movement of the eyes exhibited by most deaf persons to obtain the knowledge which normally they would derive by the sense of hearing.

Care should be taken that the tests employed to form a diagnosis are not of a nature to do harm to the patient. I have been much struck in perusing the literature in connection with this subject to see how frequently guns and pistols have been fired, or proposed to be fired close to the patient—a procedure which is not free from the risk of doing permanent injury to the patient's hearing.

In cases in which there is no apparent reason for the simulation, recovery may sometimes be hastened by the medical attendant behaving as though he considers the condition genuine. The statement made in a conversational tone of voice to the friends in the presence of the patient, that in such cases the hearing often returns as suddenly as it has gone, and therefore they need not be surprised if in this instance it is restored quite suddenly, will often have a beneficial effect, whereas if the patient thinks that malingering is suspected, the simulation may be maintained in order to prove that such is not the case.

Expressing sympathy with the manner in which the patient is afflicted, and carrying on a conversation on these lines with the friends whilst the examination of the patient is being conducted, and then asking the patient to put out the tongue or some request of that kind, will sometimes lead to the request being acceded to, the patient having been thrown off his guard by the apparent serious and sympathetic manner in which the examination was being conducted. Many malingerers have been detected by this method, but when it is a case where there is no apparent reason for the simulation, it is often advisable to make no comment on the return of the hearing power beyond satisfaction at the discomfort being no longer present.

Dulness of hearing is more frequently simulated than absolute deafness, and, as before mentioned, in some cases the present condition assumed is merely an exaggeration of an old defect. A large number of tests have been employed to trick a supposed malingerer into giving an answer which would expose his deception. The following are amongst those considered most satisfactory. For unilateral deafness, supposed to be simulated: A plug of cotton-wool is inserted into the meatus of the normal ear and a vibrating tuning-fork is then placed on the vertex. An impostor will probably assert that he does not hear the sound at all, whereas perception must be decidedly increased in the occluded ear. He may, on the other hand, admit that he hears the sound, though very faintly, on the deaf side. A plug of cotton-wool should now be placed

in that ear; the sound ought to be strengthened, and the assertion that it is no longer heard will be proof of the imposition.

The watch and speech may be used as tests, and the following plan will serve to detect imposition: The eyes are covered with a bandage, and the hearing distance for the sound ear is carefully determined. A plug of cotton-wool is then inserted into this ear, but not closely packed. When tested as before by means of the watch and speech, an impostor will probably assert that he hears nothing, whereas the insertion of cotton-wool into the meatus affects but slightly the hearing distance of a normal ear for speech. Words uttered with a moderate degree of loudness can still be heard at a distance of several yards. This test may be modified as follows: The examiner explains that he wishes to introduce an india-rubber plug into the sound ear; but he uses a piece of india-rubber tubing, which fits the meatus accurately, or a plug furnished with a stopper, which is withdrawn after insertion. Little, if any, difference will thus be effected in the hearing power; but an impostor is likely to assert that his hearing is greatly impaired, or perhaps quite abolished.

The voice may also be utilised as a test in this way: The distance is ascertained at which spoken words can be clearly heard. The person's eyes are then bandaged, and the examiner retires to a greater distance, and utters words with the same degree of intensity. He then tests the hearing at various distances, some within and some beyond the normal distances. An impostor will get confused, and will probably assert that he fails to hear words uttered close to his ear, whilst those spoken at a much greater distance are admitted to be audible. There is yet another plan: The examiner, remaining in the same spot, repeats a word several times, gradually lowering his voice.

Here is another method, based on the Teuber's principle: A tube is inserted into each ear; the examiner speaks through one, and his assistant through the other at the same time. In a genuine case the patient will repeat only what has been spoken into the normal ear: an impostor will become confused, and will repeat words heard on the side on which he asserts that he is deaf.

A binaural stethoscope may be utilised for detecting feigned unilateral deafness. In a case in which it was tried the patient asserted that he was deaf on the left side. A tightly fitting wooden plug was inserted into the right rubber tube and both rubber tubes were placed in the metal ones. Testing the instrument on himself, the examiner found that speech was not heard by the right ear. When the patient was thus tested he repeated without hesitation words spoken into the funnel-shaped end of the instrument which served as the mouthpiece. The tube containing the plug was then withdrawn from the right meatus, which was firmly closed by pressure on the tragus. On again speaking into the stethoscope, which was still connected with the left ear, the patient positively asserted that he heard nothing. He was conscious that the tube through which he had (as he supposed) before heard was no longer connected with the right ear.

For the detection of simulated bilateral deafness a bandage should be placed over the eyes, and each ear tested separately by speech and the acoumeter, the patient's statements being carefully noted with a view to discover contradictions. For the detection of simulated total deafness the person must be seen when asleep, and the amount of noise required to rouse him should then be noticed. If placed under chloroform, so as to become only partially insensible, an impostor may answer questions put to him, or show by some remark that he hears the conversation that is

going on around him. It has been suggested that during the ordinary examination a third person should make some disparaging or insulting observations with reference to the suspected impostor, while the examiner notices whether any effect is produced upon the features of the latter. Another suggestion of a similar character is that the examiner should tell the person that he may go, that he is unfit for work, etc. Such plans, however, would fail to detect a clever impostor, who would be quite prepared for any such attempts to throw him off his guard.

The following is another method which some consider of use: The subject under investigation, with his clothes on, is stroked on the back alternately with a hand and with a brush, and after that the back is stroked with the hand whilst the physician's sleeve is simultaneously stroked with the brush. If the patient is really deaf, he will correctly answer whether his clothes are being stroked with a hand or a brush, as during these operations he solely trusts to his sense of feeling. The malingerer on the other hand, will contradict himself in his replies, as in his case the perception of hearing is mixed up with that of feeling, and he does not know exactly whether he perceives the contact of the hand or brush, the noise of which he hears.

The PRESIDENT (Dr. J. DUNDAS GRANT) demonstrated a case of a woman, aged twenty-nine, unmarried, who complained of deafness, worse on the left side, which came on suddenly, three and a half weeks previously, after a "fit." The "fit" was probably cardiac syncope. She was said to have been unconscious for several hours after the fit, and there was an hysterical element in the case. Her head occasionally became dizzy. Since the attack she had been very deaf. The tuning-fork tests showed the deafness to be of nerve origin. Galton's whistle she heard at the mark 3·4 on the right side, 3·2 on the left. Her pharyngeal reflex was diminished, her knee-jerks increased; occasionally she had nystagmus to both sides. On walking with the eyes shut she deviated to the left. The voice-raising test with Bárány's "noise-machine" gave a very slight positive result. An interesting feature was that after a considerable amount of examination, including post-rhinascopy, she seemed to "thaw" gradually, and certainly heard a little better at the end of the interview than at the beginning. When shown the hearing had greatly increased. It seemed to be entirely a neurosis. The President considered that the case was a genuine instance of functional deafness. She suffered from heart disease, and was consequently in a weak state, and her circulation was defective. There seemed to have been almost absolute deafness, but she recovered on her sensations being awakened in another direction. The diminution of the pharyngeal reflex was a sign of partial anæsthesia, though the case showed no actual heminaesthesia.

Among the cases which had come under his notice was one of a worker in construction of a tunnel under the Thames. Many of the workers on that undertaking suffered from caisson disease, and they were compensated for their deafness. This man came to him with what was considered to be unilateral deafness. The tuning-fork on the vertex was better heard in the good ear; and when the good ear was stopped up he professed not to hear at all. This profession was still kept up when the good ear was stopped, not with a solid plug, but with a hollow tube.

A case of pure hysterical deafness was that of a young girl, whose nerve-deafness was equal for all parts of the scale, and she was absolutely deaf for conversation. He thought one of the best proofs of the genuineness of deafness was the fact that a patient unwittingly acquired lip-reading; and this patient did. In her case he tried various methods of

treatment, but nothing did her any good; later she was taken seriously ill, and this illness so completely altered her feelings that she woke up one morning hearing quite well. Such cases became more clear if we adopted the idea that the patient was the subject of self-hypnotism; and the exhibitor understood that such people were not good subjects for hypnosis practised by another person.

The reflexes sometimes indicated that the patient was hearing. A shrill whistle blown in the neighbourhood of the ear produced dilatation of the pupil if the patient did not know it was to be blown; he had found that useful in cases of deaf-mutism.

Another case he considered to be merely functional. But on further examination he found that improvement was not taking place, and it appeared that the attack of deafness came on during severe neuritis affecting the side of the head, and that might have included the auditory nerve.

An instructive case occurred while pilocarpin was the vogue. A girl was sent to him as being absolutely deaf. Every case of nerve-deafness was then thought to be suitable for pilocarpin, and she had injections of this every morning. On the second morning she began to hear a little of the traffic in the road, and on the third morning she heard well, and went home that day as a wonderful cure by pilocarpin. It was purely functional or simulated deafness.

Simulation did not confine itself to deafness: he had seen simulation of suppurative ear disease. In one such patient there appeared to be cheesy-looking material, and extraction and investigation proved it to be actually cheese. Another case was one of hæmorrhage from the ear in a girl at school. There was no evidence of erosion or ulcer from which the blood could come, but she had a carious molar tooth, with a polypus in it, and the slightest suction produced copious bleeding. She soaked handkerchiefs, and admitted that she did not like school.

A very interesting case was one of a poor lodging-house drudge who had undergone a radical mastoid operation; after her dismissal she returned complaining of pain over the mastoid wound, from which a small scrap of bone was seen projecting; this was extracted, and though a very exceptional occurrence, was allowed to pass at the time. When, however, the following week she returned with another loose piece of bone in the same position, it became obvious that the occurrence was not a genuine one. She was therefore ordered at once into the hospital, and the matron investigated her garments and belongings and found that the poor creature was armed with a bone from a joint, from which she broke off the small scraps which she inserted into the mastoid wound.

He agreed with Mr. Hovell's advice not to be too ready to assume a case to be simulated, because he had been given infinite trouble through letting the patient see that was his view. Many cases one could not be quite sure about. When the tests were somewhat incongruous, it was probable that the case was functional, and especially if the dulness for high and for low tones was equal.

Dr. W. MILLIGAN's experience was that such cases were very difficult to unravel. He was surprised that Mr. Hovell had not enumerated in some detail some of the more modern tests, such as the vestibular reactions, the caloric tests, etc., which were of great use in differentiating functional from organic disease. He had found great help from the vestibular reactions in cases of doubt, for in hysteria they were quite different from those met with in organic disease. Dr. Dan McKenzie had published work on that subject. His experience had been that the

simulated or functional diseases of the ear were mainly in the class of internal ear diseases. It was very seldom that one met with simulated affections of the external auditory apparatus. A very important point arose in the case of a person who had had disease in the external or middle ear beforehand, and on the top of that simulated an increase of his trouble. Such cases were very difficult. The question of whether the patient was going to get damages or not had much to do with some of these cases getting well or otherwise. One case was that of a gentleman who was driving across a Yorkshire moor on a high dog-cart, and alleged he had been attacked and shot at by a neighbouring landlord, as a result of which he had lost his hearing, some pellets having entered his face. He (Dr. Milligan) could find no evidence of this. Feeling sure it was simulated deafness, he advised his counsel to get the matter settled out of court, and that he should get some damages because he was wounded in other parts of his body. As soon as he got his damages his hearing returned. Simulation of deafness was more often on one side than on both, and required great care in its elucidation.

Dr. MACNAUGHTON-JONES said that to him hysteria stood out as a distinct condition and a definite entity, with well-defined nervous phenomena and physical signs, quite apart from either neurasthenia or psychasthenia. In the nerve fatigue of neurasthenia the auditory nerve sometimes participated. When there was a typical psychical mental condition superadded to the fatigue, and when more manifest brain fatigue was present, we had to deal with psychasthenia, and here also one met with true functional auditory affections. He knew of no term in the whole of medicine which was more casually applied than that of hysteria. For his part, he did not think that he had ever seen a case of deafness that he would define as one of true hysteria. Nearly all the cases of functional trouble which he had come across, and in many of which nerve fatigue was present, were shown, not so much in deafness as in other affections of the auditory apparatus. For instance, we saw it in hyperæsthesia acustica, in which condition the sufferer could not live in a house with a piano, so great was the degree of auditory hypersensitiveness, and the striking of some particular note or chord caused a painful sensation. Many functional ear conditions were associated with weak heart and alterations in blood-pressure, and there was an undoubted connection between the cardiac and the aural conditions. He once knew a case of functional deafness which was associated with inability to stand and which threatened rather serious consequences to the person affected. The deafness and staggering gait passed off the same day. It had followed on an unusually large dose (30 gr.) of quinine.

Dr. PEGLER had not heard any mention as to whether the condition was much associated with tinnitus. He had recently seen a lady with unilateral deafness associated with tinnitus, which was probably functional. In her right ear she complained of sounds like the rushing of water down a weir. She had lived for twelve years in a house near a large weir, and sleeping in a room much exposed to the noise of the water. The treatment consisted in regular catheterisation with medicated vapour under pressure and vibratory massage of the tympanic membrane, combined with hydrobromic acid and strychnine. Removal to another residence completed the cure.

Mr. MACLEOD YEARSLEY related the case of a malingerer whom it was very difficult to catch. Finally, he retired with the other surgeons to a far part of the room while the subject was getting ready to go, and he (Mr. Yearsley) told them in an ordinary low voice funny stories,

watching the man's face meanwhile. The man was quite unable to restrain his laughter, though it was patent that for some time he had been making great efforts to control his muscles.

Dr. DAN McKENZIE considered that in organic deafness, particularly in old-standing cases, there was an element of functional disability. It was to this fact, probably, that the success of those forms of treating deafness by means of musical noises was to be attributed; that the noises aroused the nerve-centres and rendered them more acute by re-educating them. Other methods of treatment which were successful in some people's hands exclusively also owed their success to this fact in all probability. With regard to the presence of functional disability in an organic case, he had a case, which he saw some time ago, in a lady who was absolutely deaf to all sound save thunder, and had conversed on her fingers for twenty years, yet her bone-conduction for the tuning-fork over the mastoid was increased. One did not find such severe deafness from middle-ear disease alone, consequently the case must have been one in which the deafness was to a great extent functional.

Mr. HUGH JONES said he had thought there was often an added element of functional deafness, not only in cases of chronic deafness, but in more or less recent deafness in children and adolescents of degenerate type. Beside the stigmata of degeneracy in the naso-pharynx and palate it was possible that there was an epithelial change in the nerve apparatus, somewhat comparable to that seen in the teeth, crystalline lens, and other epiblastic tissues, which accounted for much of the deafness which one found it difficult to label, and which made such individuals liable to functional deafness.

Mr. MARK HOVELL, in reply, said that some difficulties in hearing he attributed to the patient getting into a condition in which no attempt was made to listen; it might be called a disuse apathy.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

February 7, 1913.

MR. T. MARK HOVELL, *Vice-President of the Section, in the Chair.*

Treatment of Sarcoma of the Neck (secondary to Tonsil) by Seleniol Injections.—C. W. M. Hope, F.R.C.S.—Male, aged twenty-five, came to Golden Square on September 7, 1912, with swelling of right tonsil; two months' history of enlargement. Tonsil was size of a hen's egg, hard, and ulcerated on the anterior surface, September 17: Removed by enucleation *via* the mouth, after a preliminary laryngotomy. Microscopical report: Mixed-celled sarcoma. November 11: Slight induration felt beneath upper end of right sterno-mastoid. December 6: As mass was increasing, extending from base of mastoid process to upper border of thyroid cartilage, and head movements were becoming limited, it was cut down on. The whole of the tissues were indurated, and a gland was removed lying very deep in front of the transverse process of the second cervical vertebra. It was broken down and necrotic. Wound healed by first intention. December 13: Microscopic report—sarcoma undergoing necrotic changes. December 14, 17, 21, 24, and 28: 3 c.c. of

seleniol injected into the mass on each of these dates. January 10, 1913: The deep mass has completely gone; only thickening present in scar, which is freely movable. Patient feels and looks very well; has gained 5 lb. in weight in the last two weeks.

Mr. DE SANTI said he did not think the method used in the case had done any real good. He had not tried the seleniol method, but he had occasionally tried other vaunted and new substances for inoperable malignant growths, such as Coley's fluid, but had not found any of them of any use at all. In the case shown by Mr. Hope the tonsil had been enucleated, and he did not see why the glands also were not removed at the same time, or shortly afterwards, whether enlarged or not. He had had eight or nine such cases, and there had been recurrence in all of them within periods ranging from three months to four years. As a rule these cases were very hopeless, and he feared this patient would go from bad to worse.

Mr. BETHAM ROBINSON did not agree with such a strict laying down of the law as Mr. de Santi had given, as there were cases of sarcoma of tonsil clinically which had different histological appearances; those of the soft lymphadenomatous type did very well from the point of view of the operation. Even if the growth did recur, which was highly probable, the interval might be considerable, therefore he would not agree that such cases should not be touched. He agreed that the cases where there was much infiltration in the neck, without marked definition, were hopeless and would rapidly recur.

Dr. BRONNER asked if any member had tried antimeristem?

Mr. HARMER had treated a case of extrinsic carcinoma of the larynx with it, and believed that it had increased the rate of growth very materially.

Mr. HOPE, in reply, said that he did not bring the case forward as cured, but the man had an enormous mass in his neck when he started to inject him and it would have been hopeless to attempt to remove the whole mass. The mass subsided to some thickening beneath the skin incision. He started injecting him again on his second visit and the growth was again smaller.

Laryngeal Tumour treated with Seleniol.—C. W. M. Hope, F.R.C.S.—Male, aged fifty-three. Loss of voice for several months, with increasing dyspnoea. Admitted November, 1912, with marked stridor, hoarseness, and inability to lie down in bed. Right arytaenoid and ventricular band were replaced by a large red, smooth swelling, not mobile; left arytaenoid and cord also swollen, but much less so; movable. Neither cord could be seen and there was practically no glottis. Diagnosis made of swelling above a malignant ulceration. There was some definite thickening on the right side of the neck over the right ala of the thyroid, and a small, hard gland could be palpated. As patient seemed so ill and in bad condition laryngectomy was not advised. Injections of seleniol (3 c.c.) were made three times a week into the deep tissues near the right ala of the thyroid cartilage. After the second injection patient felt great relief, all dyspnoea disappeared, and he has since been able to lie down and sleep the night through. He feels much improved generally and looks better. Weight is stationary. January 15, 1913, by direct method, a large fungating mass was seen involving the right side of the epiglottis on its laryngeal surface, the right arytaenoid, and extending down through the glottis. On January 29, 1913, the fungating mass had largely disappeared, leaving a large, fairly clean ulcer, and at the

lower border the cricoid ring could be felt bare. Patient has now a much larger glottis and the posterior part of the left cord can be seen by indirect examination. Seleniol is an electrolytic colloid of the metal selenium, and may be injected subcutaneously, intravenously, or directly into the tumour. There is absolutely no toxic effect, and the growth is said to either absorb or liquefy.

Pedunculated Growth of Nose.—**W. H. Kelson, M.D.**—A man, aged seventy-two, came complaining of watery discharge and difficulty in breathing through the nose. There was a pedunculated growth taking origin just below the anterior end of the right inferior turbinal.

Dr. PEGLER said that although one could not feel sure what such a case was until examined microscopically, he thought this would prove to be a mucous hypertrophy of the inferior turbinal, with an exceptionally narrow pedicle.

Dr. KELSON considered the condition rare. He proposed removing the growth, and would show a section of it at a subsequent meeting.

Syphilitic Laryngeal Stenosis with Calcification of the Fascia of the Neck.—**T. B. Layton, M.S.**—This patient was formerly shown at the Laryngological Society at its fifty-first ordinary meeting on June 2, 1899, and the following is copied from the proceedings of that meeting. (Shown for Mr. Charters Symonds by Mr. Steward.) The patient, a woman, aged thirty-two, complained of loss of voice and difficulty in breathing, and gave the following history: When a child she had an abscess on the right side of the neck, and at about the same time she became deaf. About ten years ago (*i. e.* in 1889) swelling and stiffness of the neck began, and this has gradually increased since that time. The present attack of hoarseness commenced three months ago. The patient is deaf, the skin pallid, the bridge of the nose broad and flattened. Just behind the angle of the jaw on the right side is a large scar. The whole of the structures in the front of the neck are hard and matted. There is great thickening around the hyoid bone and thyroid and cricoid cartilages, and these structures appear to be united in a dense, hard mass. There are several enlarged glands in the submaxillary region, and lower down in the neck are several very hard nodules, one, particularly hard, being situated in the right sterno-mastoid muscle. The soft palate and pharynx are much scarred, and are adherent to one another. The upper opening of the larynx is red and swollen, and there is ulceration on the right ventricular band.

In the subsequent discussion Sir Felix Semon suggested that the condition might be specific, and Mr. Steward agreed. This view has since been confirmed; firstly, because the Wassermann reaction was positive, and secondly, because interstitial keratitis has appeared.

The impression of Mr. Steward is that the external condition in the neck is unchanged since he saw her thirteen years ago. The present condition differs, however, in two ways from the description given above:

(1) The bridge of the nose is no longer "broad and flattened," suggesting that there was then active inflammation which has since become quiescent.

(2) There is now no sign of any active disease in the larynx. There is no redness, swelling or ulceration either of the epiglottis or of that part of the arytaenoid region which can be seen. Examination, direct or

indirect, of the larynx is impossible because the contraction of the neck prohibits extension of the head.

She suffers from some dyspnoea, which varies from time to time. Salvarsan (0.6 grm.) was given intravenously in May, 1912, but does not seem to have made any difference. An X-ray picture shows the mass to throw a dense shadow.

Will the case progress so much as to need a tracheotomy? and if so, is there any means of finding out whether the contraction is limited to the larynx or extends right down the trachea?

MR. BETHAM ROBINSON said that the extreme hardness about the hyoid bone and below the jaw was much the same as fifteen years ago, but there was now more thickening about the right sterno-mastoid, and the nodules seemed to be in the fascia over it; the laryngeal appearances were little changed.

MR. LAYTON replied that if tracheotomy was suggested thirteen years ago and she had done without it, that was a reason for staying one's hand now.

Webbing of the Vocal Cords in the Anterior Commissure due to a Shot Wound.—**John F. O'Malley, F.R.C.S.**—A boy, aged eleven. Sixteen weeks ago he was standing near a brick wall with his right side towards it. His brother, who was cleaning a toy gun, which contained an "Eley 14" cartridge, fired it off by accident against the wall close to where the patient stood. Several of the pellets ricocheted off the wall and lodged in the patient's neck. He expectorated some blood immediately and became hoarse soon after the accident, and his voice has remained altered since then. An X-ray examination shows four pellets on the right side and one on the left. The latter is opposite the transverse process of the seventh cervical vertebra, and to reach this position it must have traversed the larynx from the right side, and in doing so has damaged the vocal cords. A laryngeal examination shows the anterior third of both cords united by a web or band of connective tissue. The movements of the cords behind the adhesion, and of the arytaenoids, are quite good.

MR. BARWELL some years ago had a similar case in a man as a result of a gunshot injury in the Zulu war. He had almost the same kind of adhesion between the vocal cords. As the aperture was ample for breathing nothing was done. That was the case here also, so he would not advise treatment from that point of view.

MR. WAGGETT thought it undesirable that the boy should be allowed to grow up with such a voice. A plastic operation, after laryngo-fissure, entailed no danger, and even if unsuccessful could not leave the voice worse than it already was.

DR. FITZGERALD POWELL did not think than an operation was indicated in this case at the boy's present age, and advised waiting until his voice had changed, and he had grown older. At the present time there was plenty of room for breathing, and though his voice was bad, there was a danger of making it much worse if he were operated on.

DR. H. J. DAVIS would not do anything in this boy's case at present; his larynx was very small and undeveloped. But if anything were done he thought it should be through the bronchoscope by dilatation. He thought, with Dr. Powell, that the voice might be worse after thyrotomy.

DR. MILLIGAN said he would operate by one or other of the methods suggested, because if left until the boy's voice was fully developed there would be considerable atrophy of muscles.

Dr. LAMBERT LACK expressed the view that operations on the larynx in children were usually failures, and it was better to defer operation until they had grown up. Not only might operation permanently impair the voice, but it might cause stricture of the larynx.

The CHAIRMAN (Mr. MARK HOVELL) said his view was that it should be left for a time to allow the larynx to develop.

Adhesion of Uvula and Soft Palate to Posterior Pharyngeal Wall in a Girl, aged twelve.—James Donelan, M.B.—Neither parent nor patient has any recollection of any throat affection. Was sent to Italian Hospital by school inspector on account of imperfect nasal respiration. The father was a healthy man until two years ago, when he developed tuberculosis. He is now in an advanced stage of the disease. The mother is a healthy woman. Four healthy children older than this. No miscarriages. Patient has chronic otitis media on right side.

Dr. DONELAN added that since he examined the case a fortnight ago and hooked a bent probe around the uvula it had become detached. It had also shrunk to a third of its former length.

Dr. McKENZIE asked what was the experience of members in operation for adhesions between the soft palate and the posterior pharyngeal wall. He had operated twice on such a case and found it unsuccessful. He saw a case in which Dr. Grant removed part of the bony palate and after the operation brought the uvula forward by suture and attached the suture to one of the incisor teeth; the result was the best he had seen. Another method was to put two long rubber tubes in, one through each nostril, bring them out of the mouth and attach them outside.

Mr. DE SANTI mentioned a successful case shown some years ago in which there was complete adhesion between the remains of the soft palate and the posterior wall of the pharynx. Mr. W. G. Spencer detached the adhesions with scissors and a raspator. There was severe hæmorrhage, but he proceeded with the operation by turning forward on itself all the soft parts and transfixing the rolled-up soft parts with silver sutures, the ends of which were passed through the muco-periosteum of the hard palate and the stitches were left to cut their way out. There was previously no aperture between the nasopharynx and the oropharynx, but, afterwards a large forefinger could be passed behind. Two years later she came under him (Mr. de Santi) with complete re-contraction, but no re-adhesions, and an ordinary Eustachian catheter could not be passed up into the nasopharynx. Shortly after Mr. Spencer's case he (the speaker) had an exactly similar case of his own and expected severe hæmorrhage, but there was no great bleeding. Though that was ten years ago re-contraction had not occurred and there was an excellent opening, and he had had three or four similarly treated since. In all of them some re-contraction had occurred but no re-adhesion, and in every case a sufficient opening was obtained for all post-nasal discharges, etc., to come down into the mouth.

Mr. BETHAM ROBINSON mentioned a case shown some years ago in which he passed a bent sheet of lead round the detached soft palate, with silks at each corner, the upper silks going through each nostril and the lower through the mouth. The plate was kept in position for a fortnight, and it did very well.

Dr. MILLIGAN said it was very difficult to prevent such cases re-adhering. He recently had a case of complete adhesion to the soft palate and had operated upon it twice. He first used a rubber drainage tube to pull the palate forward, but the patient said he had been uncomfortable

for days. In two years he came back with an aperture which would only admit a pencil. He then passed tapes of lead through the nose and round the upper lip, keeping them *in situ* for ten days. The result was fairly good; but he saw the patient again eighteen months ago, and though the aperture was now somewhat larger, the result was still poor.

Dr. FITZGERALD POWELL had three or four cases in which he had operated, and in one particularly he had an excellent result which persisted. It was the retraction of the palate which was the difficulty: it was not so difficult to prevent the adhesions. He had used large rubber tubing with silk through the nose, which could be taken out to clean. They were kept in for a month or two. He thought the use of the tubing should be persisted in for a long trial to obtain a good result.

The CHAIRMAN remarked that grafting had not been referred to. The best tissue for that purpose was a child's prepuce. An actress came to him about nine years ago with some slight nasal obstruction, which at the most required cauterisation. A few months later she came with a considerable amount of stenosis in the nasopharynx, and inquiry revealed the fact that she had been operated upon for nasal obstruction. The soft palate had been severely lacerated, and in consequence, except in the centre, was adherent by almost the entire length of its edge to the posterior wall of the pharynx. Her voice was considerably affected. Subsequently the soft palate was separated and a portion of a child's prepuce, from which the skin had been removed, was sewn to the lower part of its edge on each side. When seen about nine months ago there was still a very good opening.

Dr. DONELAN had had last year a case in which the right posterior pillar and part of soft palate were adherent to the pharyngeal wall. After prolonged antisyphilitic treatment he had divided the adhesions and maintained the separation by extension of the patient's tooth-plate on the affected side. This was used for nearly six months and the trouble had not recurred. He had often thought that a special plate, curved well up behind the choana, with room in it for the folded palate, would be a very useful apparatus in such cases.

Combined Tonsillotome-Tonsillectome.—James¹ Donelan, M.B. —The tonsillotome is that of which the working model was shown on November 1.¹ In view of the present vogue of instruments with blunt blades for the purpose of enucleation in giving the instrument its definite form, it has been made more strongly and fitted with an accessory blunt blade. When the blunt blade has been well driven home by the thumb in the ordinary way, a screw can be readily attached and the enucleation completed by pressure. The shape of the lunette is also such that on tightening up the screw a scissors action is obtained from the closure of the angles between its edges and those of the blade. This instrument has also a sharp blade for ordinary tonsillotomy. In adding this device for the convenience of those who favour this method of enucleation the exhibitor does not wish to be understood to share their views.

Dr. WATSON-WILLIAMS showed the latest pattern of his tonsillectomy forceps, an instrument which he originally devised because his thumb was too weak to use with comfort the ordinary Schluder pattern with a blunt blade. The blade being driven home by the grasp of the hand, it would readily separate the tonsil from its bed, or cut through the most fibrous tonsil if so desired. It was especially serviceable in rapidly enucleating tonsils in children under short anaesthesia.

¹ See JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOL., April, 1913, p. 202.

Sluder's Guillotines.—H. J. Davis, M.B.—An account of these instruments was given at the last meeting of the Section. The exhibitor exhibited them again, together with other instruments exhibited by others who have designed them with the same object in view—*i. e.* enucleation of the tonsil with the capsule intact.

Mr. HOPE said he did not like the handle of the Sluder instrument, because it got in the way when opening. The old handle was preferable.

Mr. FAULDER said he used nothing for this purpose except the old Mackenzie instrument, with Heath's strengthening.

Mr. O'MALLEY said he did not like the slotted ring; his instrument had a recess instead of a slot, and that was filled with lead. The hæmorrhage he had from the operation now averaged only three drachms.

Mr. HORSFORD had made a modification of Heath's instrument, by making the shaft stronger and the cutting point thinner. He tried it on half a dozen cases, and in each there was complete enucleation. Success depended on pressing the tonsil forward against the angle of the jaw.

Dr. DAN MCKENZIE asked whether those who preferred crushing had watched their cases afterwards in respect to the cicatrization. He had seen nasty cicatrices after the procedure.

Dr. MILLIGAN said he had seen Sluder operate, and he had watched a house-surgeon at one of the Boston hospitals use the snare, and he came away impressed with it; although only a junior he did the operation with great skill and finish. Sluder's method seemed somewhat brutal in respect to the force used.

Mr. WAGGETT advocated the use of the snare for enucleation. The operation was performed in a bloodless field if two snares were employed after the manner recommended by Guisez. The double operation occupied about ninety seconds, and failure to accomplish complete enucleation was very rare.

Dr. DUNDAS GRANT said that when the upper pole of the tonsil extended far up, its enucleation was considerably facilitated by means of a small incision cut through the uppermost part of the anterior pillar into the bed of the tonsil. This was best accomplished by a small rectangular knife, sharp on the edge and blunt at the tip. When this was done the upper pole was generally enucleated quite easily by means of the guillotine. The removal of this part of the tonsil was of special importance in cases of recurrent peritonsillar abscess.

Dr. KELSON said that it should always be remembered that some tonsils were easily removed, but others difficult, and these latter were the ones which chiefly interested us. The extremely rapid enucleations one sometimes heard of referred to the former.

The CHAIRMAN used the Mackenzie instrument. With a new instrument the blade was on the edge of the opening. If a tonsillotome was so thin that it bent, he should scrap it and buy a new one, as an instrument in good condition was rigid.

Serrated Adenoid Curette.—H. J. Davis, M.B.—This instrument was designed by Dr. Leslie-Davis, of Philadelphia, U.S.A.; it is thin, flat, and very sharp, and the cutting blade is serrated in a series of curves. The exhibitor has used the instrument, and when used in the way the designer intends, it answers its purpose remarkably well. The instrument is inserted behind the palate, then rotated rapidly on its vertical axis, quickly withdrawn, and the growth is removed *in toto*.

Swelling in the Right Upper Jaw in a Boy, aged eight.—H. J. Davis, M.B.—The tumour is either a dental cyst or a sarcoma; it has been growing steadily the last few months. The right side of the face is opaque to Heryng's transilluminator. The tumour appears to be bony in parts, and fluctuates (?) in others. The jaw-bone is expanded and the palate bulged inwardly.

Mr. ROBINSON said there was no doubt it was a cyst. On pressing on the surface of the palate one found definite elasticity, and from the irregular condition of the teeth it was probably a dentigerous cyst with a tooth inside rather than a dental cyst, which was usually associated with root inflammation. He did not think it was connected with the antrum.

Dr. DAVIS replied that it was now larger and denser than it was a fortnight ago. Three years ago he exhibited a similar case; it was operated upon by the house-surgeon in the out-patient department, and the boy developed osteomyelitis of the jaw, and nearly died. There was always some risk that these cases might become septic when dealt with by the buccal route. The whole of that side of the face was dark on transillumination.

Mr. ROBINSON had removed a dentigerous cyst from a child of the same age, and in the same position, and he uttered the caution that the antrum was probably a very small one, and was overlapped in front by the cyst, and it would be easy to enter the antrum.

Dr. FITZGERALD POWELL said: As the antrum was dark on transillumination it should be explored before an operation was done, as there might be a solid growth in the antrum and not a cyst.

Rodent Ulcer of Orbit.—H. J. Davis, M.B.—Operation has been performed and the eye removed. The outer wall of the nasal cavity is freely exposed, showing the fronto-nasal duct, the ethmoid cells and the outer surface of the superior and middle tubinate bones. The patient is a woman, aged forty-five, and has had an extensive operation on the orbit. The upper eyelid is adherent to the posterior orbital wall. The inner orbital plate has been removed, showing the structures as above described *in situ*. There is no disease in the nasal cavity.

[*Note.*—March 7: The patient was operated upon a few days later. The large cavity entered was full of pus, and the disease was reported upon as tuberculous.]

Lupus of the Tongue.—H. J. Davis, M.B.—Patient is a boy, aged fourteen. Both nostrils are filled with lupoid growth. The palate, pharynx, posterior nares, the epiglottis and the skin all show typical lupoid patches. The boy is in no inconvenience whatever, but he is very pale and looks ill. Lupus of the tongue is rare; it is proposed to excise the granular patch on the tongue, to curette the nares, and to treat the palate and epiglottis with lactic acid, 50 per cent., and orthoform, and to give injections of tuberculin.

Dr. PETERS said the case showed the different characteristics according to the situation: Hypertrophic lupus on a moist surface, such as in this case on the palate, an almost atrophic condition when it affected a dry spot—the anterior nares in this case—and warty lupus on a thickened surface, the friction surface of the tongue.

? Leontiasis Ossea.—T. Jefferson Faulder, F.R.C.S.—F. C.—, aged twenty-four. History: Swelling in the nose and of the left side

of the face noticed for three years. Watering of the left eye for about the same period. No other symptoms complained of. Present condition: Epiphora of left eye; slight fulness of the left cheek; mucous membrane in the floor of the left nostril raised by a swelling which is intensely hard. On transillumination the left side of the face is absolutely dark, the right side nearly so. Skiagrams show a diffuse thickening of the left superior maxilla, and, to a less extent, of the right side also. Attempts made to explore the tumour with a trocar in various places through the nostril proved its extreme hardness. He did not contemplate interfering surgically with the tumour itself as it had no definite boundaries. But as the patient had permanent obstruction of the nasal duct, he seemed to be running a risk of infection of the lachrymal apparatus, and the question was whether the lachrymal sac should be removed, or whether some other way of relieving the epiphora could be found.

Mr. ROBINSON thought it a chronic inflammatory condition of the bone (osteosclerosis), spreading widely, and probably it was of the leontiasis ossea type. Iodide of potassium should be given.

Dr. DONEGAN regarded it as a case of old inflammatory thickening of the bone. The patient said he had had rhinorrhœa since childhood. There was a similar condition on the right side, but it had not grown up from the floor of the nose so as to obstruct the lachrymal duct. He had had a case of acute rhinitis, followed by separation of part of the intermaxillary bone. Years later there was a swelling on the other side, like that in this case. It was removed by reflecting the coverings and gouging out the bone. He thought that a good result as regarded respiration could be obtained in this instance, but it was unlikely the epiphora would be cured without dilatation or other treatment of the canaliculæ.

Mr. DE SANTI agreed with Mr. Robinson, and said he would not operate.

Dr. PEGLER thought the bilateral character, as shown by examination of the opposite fossa, indicated a form of leontiasis.

Dr. MCKENZIE suggested that the nasal duct be opened above the inferior turbinal in the outer wall of the nose.

Chronic Pemphigus.—E. A. Peters, M.D.—A male. There is no history of syphilis. Three years ago the middle turbinals removed, which had been converted into a mass of polypi. Three months ago a doctor removed a small polypus with a view to relieving a non-purulent catarrh of nose and throat. This was abating when several small vesicles appeared, $\frac{1}{8}$ in. in diameter, on the pharyngeal wall and later on the palate. Soon, however, large vesicles were seen on the mucous membrane of the lower lip, side of the nose, lower eyelids, wrists and neck. Dr. Adamson pronounced the condition as one of chronic pemphigus. Under arsenic, rest, and small doses of opium the condition has improved, but the palate has again been attacked by large vesicles, measuring $\frac{3}{4}$ in., in contra-distinction to the early small blebs. A bacteriological examination revealed an occasional white staphylococcus, probably due to skin contamination.

Dr. SCHOLEFIELD said the condition was similar to that he had seen follow the taking of a mixture of iodide of potassium and antipyrine; it occurred in the usual pemphigus situations.

Dr. H. J. DAVIS recommended orthoform; he had such a case where nothing else did any good, and the insufflations not only gave marked relief to the patient's pain, but the vesicles disappeared under this treatment.

Dr. PETERS did not think the patient had been having iodide of potassium. The new vesicles became larger as the disease extended outwards. He had used orthoform when the deeper regions of the throat were affected, to relieve pain on swallowing.

Suppuration of the Antrum due to *Aspergillus fumigatus*.—
Douglas Harmer, F.R.C.S.—(1) Three tubes showing secretion at different stages. (2) Tube showing growth on maltose-agar (Sabouraud's medium). (3) Films showing mycelium. (4) Films showing spore-formation. (5) Photographs were exhibited. The patient, a lady, had suffered for many years from hay-fever. In November, 1912, a severe cold commenced after motoring in an open car. For five weeks after there was a persistent discharge of mucus from the right side of her nose, and occasionally a thick membranous cast from the back of the throat. The latter was of brownish-yellow colour and had the appearance of wet blotting-paper. It was not offensive. She had violent attacks of sneezing and was wakened by it once or twice each night. The right side of the nose was found completely blocked by cedematous mucous membranes. The nose seemed to contain an inexhaustible supply of slightly yellow mucus which could not be removed by syringing. The post-nasal space was also full of mucus, and the pharynx contained a quantity of frothy saliva. The right antrum was dull. The general health was bad, and she had the appearance of being poisoned. She complained of occasional headaches and neuralgic pains around the right eye. Her nervous system had suffered and she could not sleep well at night. Temperature and pulse were normal. The digestion was somewhat deranged. Under general anaesthesia an intranasal opening was made into the antrum. On washing out, no discharge was seen for a time. After about a pint of lotion had been used small lumps of brownish membrane began to appear. This continued until six pints had been employed, when the lotion again ran clear. The difficulty in dislodging the membrane was a striking feature of the case. The material was submitted to Dr. Gordon, who reported that films stained by Gram showed a few staphylococci, and cultures on ordinary agar grew staphylococcus colonies only. In examining secretions from the upper respiratory passages, however, it is always our custom to make blood-agar plates as well, and on these there was a copious growth of *Aspergillus fumigatus* in forty-eight hours at 37° C. On re-examining the original secretion mycelium was discovered, seen best in unstained films. It was subsequently found that the fungus grew best on Sabouraud's maltose agar. Unlike the common moulds, it can grow at body temperature as well as in the cold. For the next month the antrum was washed out twice a day and quantities of mucus dislodged. Occasionally a few pieces of membrane appeared together with small gritty fragments like little bits of shell. Various solutions were tried, including salt, peroxide of hydrogen, permanganate of potash and tincture of iodine, but none of them seemed effective. The peroxide, if used persistently, proved intensely irritating, even when used in five-volume strength. Injections of alcohol to 75 per cent. and a suspension of bismuth subnitrate in oil were also tried, with no better success; in fact, the patient's general condition became, if possible, worse. After four weeks' treatment iodine was given internally, the sodium salt being employed, commencing with 2 gr. doses and rapidly increasing to twenty-three times a day. The antrum was now washed out as often as possible with five volumes of peroxide of hydrogen. Forty-eight hours after

commencing this treatment a great quantity of the membrane came away. From this time onwards there was never any difficulty in dislodging the discharge, which steadily lessened in quantity and grew whiter in colour. At the end of ten days all the discharge had ceased. The syringing was continued for three weeks more, when the antrum suddenly became quite clear to transillumination. By this time all the cedema had disappeared, together with the symptoms noted above. The general health rapidly improved, and the patient has now remained well for a fortnight.

Dr. H. J. DAVIS had just seen a lady whom he had operated upon, and who had had some trouble in the antrum for years. The whole antrum was filled with polypi. He thought the case was malignant, but the tissues were reported by a pathologist to be not malignant, but macroscopically and microscopically the polypi were invaded by a fungoid growth saprophytic in character.

Dr. PEGLER had met with this fungus in the external auditory meatus. It formed a soft mass, varying in colour from white to black, causing much pain, and perforating the drum membrane.

Dr. BRONNER said that this was a common affection of the external auditory meatus and often overlooked. Was it possible that the patient referred to had infected the nares from the ear by the finger-nails?

Mr. WAGGETT reported a case in which, some five months after a successful radical operation upon the maxillary antrum, the patient returned with that cavity completely filled with a dark green, firm, leathery mass. This was removed with considerable difficulty, and proved to consist of the mycelium and hyphæ of a fungus. The patient, a man aged forty, reported that serious nasal symptoms appeared shortly after an occasion on which he had worked upon some mouldy hay in a barn.

Mr. HARMER replied that he could find only three other cases recorded in the literature in which the disease was in the antrum. It was more common in old abscess cavities in the lung and in the ear, but apparently in the nose it was rare. This patient never had anything the matter with her ears.

Specimens of *Artemia salina* from the Nose.—Douglas Harmer, F.R.C.S.—A lady who had suffered for many years from rhinitis had been in the habit of using douches of various kinds. Recently she had used a solution of a patent sea salt which had been recommended by a friend, as it was said to possess special healing properties. After the use of this lotion she noticed intense irritation in her nose on several occasions, accompanied by attacks of sneezing. She became convinced that something was creeping about inside her nose, and on washing it out discovered the two sea monsters shown. She was anxious to know whether they were common inhabitants of this region. At first sight it seemed improbable that they ever came out of the nose at all, but the patient was sure of the fact. The history was so remarkable that the specimens were sent to Dr. S. F. Harmer at the Natural History Museum, who was able to confirm her diagnosis. He reported as follows: "Some months ago it was accidentally noticed, in the Botanical Department of this Museum, that a solution of this sea salt, left to itself for some weeks, became tenanted by a very interesting crustacean, *Artemia salina*. The experiment was repeated in the Zoological Department by Dr. W. T. Calman, with the same result. Dr. Calman published a note on the subject in *Knowledge* for June, 1911. The culture which he started on

May 9 is still in existence five months later, and has reached the second generation. The cold weather will, however, probably kill off the survivors. *Artemia salina* is well known as an inhabitant of brine pools, where it flourishes when the salt has reached a high degree of concentration. I presume that during the preparation of this salt some of the eggs get dried off with the salt, and remain capable of developing when they are put into water under suitable conditions. You may confidently express the view that your patient's theory of the origin of the *artemia* was a correct one. Dr. Calman points out that one of the specimens carries eggs, and that the solutions used would thus appear to have been some weeks old."

Syphilitic Ulceration of Pharynx and Nose.—**Harold Barwell, F.R.C.S.**—Boy, aged thirteen; aphonia three years, no dysphagia. Extensive ulceration of pharynx, larynx and naso-pharynx; soft palate and epiglottis largely destroyed. Wassermann positive. He considered it very difficult to distinguish the nature of the chronic granuloma causing the ulceration in these cases, and he doubted whether one could make a diagnosis solely by inspection.

PROCEEDINGS OF THE SCOTTISH OTOLOGICAL AND LARYNGOLOGICAL SOCIETY.

Meeting in the Victoria Infirmary, Glasgow, May 31, 1913.

DR. BROWN KELLY in the Chair.

Compression Stenosis of the Trachea and Œsophagus due to Abscess situated between these Passages.—**Dr. Brown Kelly.**—Woman, aged forty, has had several operations on glands in neck during last twelve years, and nine months ago had symptoms suggestive of cervical caries. Came to Throat Department, Victoria Infirmary, on March 26, 1913, complaining of dysphagia and dyspnoea. Examination revealed an ill-defined fulness of the anterior wall of the upper part of the Œsophagus and a marked bulging of the posterior wall of the trachea in the greater part of its length. Beyond the stenosis, both Œsophagus and trachea were normal. The patient was transferred to Mr. R. H. Parry, who opened the trachea and then passed behind it from the left side, where he found a large abscess which extended down into the chest, and from which about half a pint of pus was aspirated. Dyspnoea and dysphagia were at once relieved. There is now paralysis of the left cord, which would seem to indicate that the recurrent nerve had become involved in the cicatrix.

Dr. SYME asked if there were any signs of pus before it was opened, because if there were he thought it would have been wiser to avoid opening the trachea.

Dr. KELLY replied that there were no signs of pus previous to operation. The bulging of the posterior wall of the trachea was considerable and the stridor so marked that tracheotomy was necessary as a first step.

Sir STCLAIR THOMSON pointed out in regard to the abductor paralysis that it is not always the fault of the surgeon. If the patient had been examined two or three days after the operation the vocal cords

might have been found quite mobile. Not unusually two or three weeks after such operations the patient is brought to a laryngologist because the voice has changed. He finds paralysis of one vocal cord, and he may blame the surgeon for having cut the recurrent laryngeal. But often it is due to implication of the nerve in the scar contraction which has taken place. On investigating a certain number of these cases, as he had elsewhere remarked, it is found that this occurs in those cases where the surgeon has for some reason had to keep the wound open.

Dr. KELLY replied that what Sir StClair Thomson had said with regard to the paralysis in the case operated on by Mr. Parry was correct; the recurrent laryngeal was not exposed at the operation; it was carefully avoided.

Double Abductor Paralysis and other symptoms of Central Nervous Disease.—Dr. Brown Kelly.—Man, aged forty-six. Hard chancre when about twenty. First seen by exhibitor in 1900 for specific glossitis. In 1904 began to have attacks of laryngeal spasm. Examination during one of these, which occasionally lasted several hours, showed that the ligamentous cords were closely approximated, and that respiration was conducted mainly through the triangular gap behind the vocal processes. From this time onwards, even between the attacks, the cords could not be abducted beyond the normal respiratory position. After five years' absence returned to Victoria Infirmary on April 30, 1913. Incontinence of urine set in last year, and later, in succession, weakness of left arm, left leg and right leg; stridor had been worse for over a year. Complete double abductor paralysis was found. Dr. T. K. Monro believed the symptoms to be due to patchy gummatous lepto-meningitis of the medulla and of the cord in the cervical and lumbo-sacral regions. Two injections of neo-salvarsan have been given with general benefit, and tracheotomy has been postponed.

Sir STCLAIR THOMSON said the abductor paralysis is an example of how the body can adapt itself slowly to certain changes. If one had as narrow a passage as in this man developed suddenly within the next few minutes death would result. These patients get so gradually accustomed to their stenosis that it is often extremely difficult to persuade them to undergo operation. Some of these patients snore so badly that it is impossible to keep them in a ward with other patients.

Osteomyelitis of Superior Maxilla in a Child; Recovery.—Dr. Brown Kelly.—Boy, now aged five, when a few days old had swelling below inner part of left eye, discharge of matter and blood from left nostril, and eruption of a double tooth from left upper jaw (a case of so-called "empyema of the autrum in infants"). Small pieces of carious bone were removed at intervals from left nasal cavity, and the discharge ultimately ceased. The child now has a displaced tooth (? lateral incisor), a molar, and a tooth erupting in the left upper jaw, while five teeth are present on the right side. When caused to look up and to the right, the left eye is more rotated than right, so that the left pupil is half hidden by the upper eyelid. This is probably due to defective action of the inferior rectus in consequence of damage to its insertion. There is also depression of half of hard palate.

Dr. PATERSON said that these cases are not so rare as some people think, more especially if one refers to foreign journals, where one finds it stated that they are extremely rare. He thought one reason for this opinion is that some of these children go to the Eye Department in the first

instance. A few days after birth this condition sets in: an abscess forms, very often a fistula under the lid, and finally a very considerable retraction, and the case comes under the care of the Eye Department. Within the last eighteen months he saw the statement made that those cases are extremely rare and ought all to be recorded. As they knew, Dr. Kelly's was still the accepted work on the question, and his explanation is the correct one.

Papillomata of the Nose.—Dr. Brown Kelly.—Woman, aged twenty-seven years, began to have right nasal obstruction about three years ago. Shortly afterwards was found to have numerous red delicate finger-like processes growing from middle turbinate and outer wall of middle meatus on right side. Histologically, true papillomata; removed thrice. Last operation about two years ago. Now slight recurrence, occasionally blows out bits.

Dr. LOGAN TURNER asked Dr. Kelly if he had tried the use of calcium chloride in his case of nasal papilloma. Preparations of lime formed an old-fashioned remedy for cutaneous warts, and he had used calcium chloride locally and internally, he thought, with advantage, in a case of recurring laryngeal papillomata.

Dr. KELLY referred to a child, who was shown, with papillomata of the larynx. She had taken a large amount of calcined magnesia, but was back again with a recurrence within six weeks or two months.

Congenital Closure of Posterior Naris.—Dr. Brown Kelly.—(a) Woman, aged thirty-three. Complained of want of power in right side of nose, which was attributed to Bell's paralysis, also of discharge from right nostril which she could not expel. Complete bony partition at posterior naris was largely removed with sphenoidal sinus forceps. The following conditions are present: Asymmetry of face, right side being the less developed; right inferior turbinate small; right posterior naris narrower and lower than left; part of the membrane still closes upper part of right choana.

(b) Girl, aged nine. Right nasal obstruction and watery discharge since birth. Membrane closing right posterior naris was found by probing but could not be felt by finger in naso-pharynx. Opening made and tube retained for month, but on its removal closure ensued. Left half of face fuller than right.

Dermoid of the Anterior Border of the Nose.—Dr. Brown Kelly.—(a) Boy, aged six. At birth a white mark was present on bridge of nose. Later, a pustule formed and increased to size of a pea, when it was lanced at age of a year and a half. Since then it has discharged at intervals of about a week. In the middle of the bridge may now be seen "a red pimple" immediately below the nasal bones, and a quarter of an inch lower a small depression from which a hair grows, and from which a little discharge comes once monthly.

(b) Girl, aged six. When first examined presented in middle of nasal bridge a small scab on inflamed base; from this a little cream-like material could be squeezed. The "pimple" gathered and burst every four or five days. Cyst excised. A few small hairs may be seen at site of scar.

(c) Woman, aged twenty-four. Complained of pain at root of nose and of scanty discharge from opening about middle of bony bridge. A sinus could be traced upwards for three quarters of an inch, which,

together with a cyst, was dissected out. The wound healed satisfactorily. Five months later linear scar reopened and could not be got to heal. Wassermann negative. Subsequent operation, at which a small sinus in the bone was followed to dura mater, and a black spot underlying this was removed. Owing to delay in healing another operation was performed on 2nd inst., at which a considerable amount of bone was removed on each side of middle line.

Hysterical Aphonia.—**Dr. Brown Kelly.**—Female. In 1899, while a teacher, aphonia set in, and continued for five years. During this period she was treated by exhibitor and others by means of electricity, vocal exercise, general anæsthesia, hypnotism, etc. Married 1903. Operation on neck in 1905, and while coming out of anæsthesia she shouted. Voice was retained until 1908. Aphonic for great part 1909. During present year voice has been absent, excepting for a short time occasionally. Examination of the larynx at first showed paresis of transversus, subsequently of thyro-arytænoids with exaggerated action of false cords. Now the true cords approximate perfectly, and the defect appears to lie in the mode of utilising the expiratory blast. In view of the present laryngeal condition in this patient, should all cases of "hysterical aphonia" be grouped under the term "adductor paralysis"?

Dr. Mackenzie Booth said it had occurred to him that the left vocal cord on phonation was under the right; he looked at it three times, and each time it looked as if the left was on a lower level than the right. He had had a similar case under observation for two years, and, so far, only under strong mental strain the voice returns for about an hour and then disappears again. The last thing he did was to remove a diseased tonsil; immediately after the operation the voice returned; another time, after a sudden start, it returned and then went away again. He would have brought the case before the Society but for the distance between Aberdeen and Glasgow.

Dr. Sime said what interested him was that the cords do come together perfectly and immediately separate slightly. The patient seemed as if she ought to be able to speak. He suggested that it might be worth while to use the caloric tests in these aphonic cases. The vertigo produced is sometimes so alarming that the patients scream. In a case of hysterical deafness this occurred, and, moreover, the patient immediately heard quite well.

The Evolution of the Round Window and the Aqueduct of the Cochlea from Reptiles to Birds and Mammals; illustrated by Stereoscopic Lantern-slides.—**Dr. Albert A. Gray.**—**Dr. Gray** showed by the aid of photographs of dissection and diagrams the variations which are found in these structures as one passes up the animal scale. He traced the alterations in size and shape of the aqueduct and of the perilymph recess, and the changes which take place in the size and position of the opening between the latter and the cochlea, beginning in reptiles, where these two structures lie apposed, but without direct communication. In birds the adjacent walls become fused. Absorption occurs in the fused portion, and an opening between the two appears. This opening becomes larger and then again smaller as we ascend the scale, and also changes its position. The recess itself undergoes alteration, gradually losing its definite shape and merging into a simple recess in the cochlea wall, but tapering away into a tube in the part furthest

from the cochlea. In the higher mammals it is represented by a rudimentary depression continued into a narrow tube—the aqueduct of the cochlea. Dr. Gray explained how confusion has arisen in looking upon the opening between the cochlea and the recess as the forerunner of the round window, a misconception due to the erroneous view hitherto held that mammals do not possess a perilymph recess, and he demonstrated the stages by which the round window, which at first is unconnected with the cochlea and opens from the perilymph recess, finally comes to open directly from the cochlea at the place previously occupied by the opening between the cochlea and recess, which opening has now also assumed a different position.

Dr. GRAY, in reply to a question, said the accepted idea of the function of the round window was that it allows the wave of sound passing through to press the membrane outwards and inwards; he did not know that he could say anything beyond the ordinary accepted view. From the anatomy, more particularly in the snake, where the columella is fixed and where hearing is only by bone-conduction, it might be that the round window allows the vibration to displace it.

Chronic Œdema of Face, with Recurrent Acute Exacerbations (Erysipelas?), treated with Autogenous Vaccine prepared from Staphylococci isolated from Nasal Cavities.—Dr. J. R. Drever.—(a) Mrs. C—, aged twenty-five. History of erysipelas of face (January, 1910), involving both sides: subsided after a week, some swelling remaining; increase of swelling with redness at every menstrual period thereafter. Purulent nasal discharge started at time of first attack and continued since.

Condition (when first seen at the dispensary on April 1, 1913): A little swelling of bridge of nose and right cheek; pus in right middle meatus; antrum explored; no pus. On May 6 swelling much increased, extending up to right lower eyelid; no redness or tenderness (stated to have been red two days before). Similar attack on June 6. Swab from nose gave mixed *Staphylococci aureus*, *albus*, and *citreus*. Vaccine given (250,000,000) at about weekly intervals, eleven injections in all. On September 3 swelling gone; no recurrence since.

(b) M. C—, aged twenty-two. History of attack of acute rhinitis in October, 1910, followed by swelling and crusting of nasal orifice. In August, 1912, left cheek became swollen and red; subsidence after a few days; similar attacks every month (at menstrual period). Seen on October 28, 1912, left side of nose and left cheek swollen, red and glossy. Swab from nose gave *Staphylococcus aureus* and *albus*. Injections started on January 20, 1913, and continued till May 15; steady improvement.

Dr. BROWN KELLY said it seemed to him that there was still some œdema in both cases. Had any of the members tried buried strands of silk in such cases? He would like to know what effect the injections had on the rhinitis?

Dr. DREVER agreed that there was still some œdema. It had gone down very considerably, however; both cases were a little worse to-day than when he had seen them last. One of the patients, when coming up in the train, had sat with the window open, hence the swelling. The rhinitis improved very considerably after the injections.

Congenital Defect of External Ear.—Dr. J. L. Howie.—Boy, aged ten. Rudimentary left auricle and absence of auditory meatus, right cheek fuller than left, and jaws approximate asymmetrically.

Sir STCLAIR THOMSON regretted to see in medical journals that people continue to operate on these rudimentary auricles, trusting they will get down to the deep level, to the remains of the tympanic membrane. Happening to have two or three cases under observation some fourteen or fifteen years ago, he suggested to Mr. Hunter Tod that he should take up this subject. Their conclusions were published in the *JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY*. From their experience and the experience of the literature it was found that to attempt to improve these cases by exploring the auditory meatus is not only futile but harmful.

Dr. MACKENZIE BOOTH said that what struck him about the case was that although there was evidently complete blocking of the ear, aërial conduction, as tested by the watch with the other ear closed, was very good. He could not see why that should be so. In a case which he had seen some years ago the patient had scarcely any aërial conduction.

Dr. BARR asked if Dr. Howie had ascertained the condition of the hearing by thorough testing. His experience, like that of Sir StClair Thomson, has been that operations in such cases are very unsatisfactory. In these cases there is usually a certain amount of hearing, sometimes considerable, to be found on careful testing. The degree of loss of hearing depends on whether the labyrinth is also malformed, which is rarely the case.

Dr. KERR LOVE said that the middle ear is developed from a different layer altogether—the internal ear from the epiblast, and the middle ear from the mesoblast. He believed it was extremely rare to have the internal ear involved along with the middle ear and external ear in those cases, although he had seen one or two such cases. Personally he would not operate in a case where only one side was involved, but he would be quite prepared to do so where both sides were involved.

Dr. SYME said he had had a case where there was a rudimentary auricle on either side, and on one side there was facial paralysis, due, no doubt, to a defect in the Fallopian canal, which he considered to be developed in a way similar to the bony capsule of the labyrinth.

Dr. DAN MCKENZIE thought that before coming to any decision as regards operation, the hearing should be carefully tested. But it should be remembered that children who are quite deaf in one ear acquire an extraordinary acuteness of hearing in the other ear, and closing the meatus by no means shuts out the hearing of the sound ear. He took it that the object of operation was to constitute a meatus, but the difficulty is that it is practically an impossibility to form a new tube, and the patient, subsequent to the operation, is no better than before.

Dr. GRAY said the actual records show that in the great majority of cases the labyrinth is normal, but in one or two cases there was some defect. There might be a prenatal injury affecting the structures. As regards operation, they all knew when compelled to drill away an exostosis that even in such a comparatively simple operation it was difficult to do it satisfactorily.

Dr. HOWIE replied that the case was brought before the Society merely as a curiosity, and he had no intention of operating on it. Tested by the tuning-fork, bone-conduction is quite good. An X-ray photograph showed absence of a bony meatus. He agreed with the other speakers that operation would probably be futile.

Carcinoma of the Nose.—Dr. Walker Downie.—(a) H. K.—aged forty-nine. Admitted to Western Infirmary, Glasgow, suffering from fleshy polypi and discharge from nose. Pathologist's report on

piece removed: "Carcinoma of adeno-papillary type." The growth involved the lateral mass of the ethmoid. It was removed eight months ago by an external operation which permitted of full exposure of the interior of the nose, but recurrence took place after five months. This was removed, and the nose has, up to the present, remained free from the disease.

(b) J. A—, aged fifty-nine. Admitted to Western Infirmary, Glasgow, on February 2, 1913, complaining of swelling over nasal bones, extending to region of frontal sinuses. The swelling is symmetrical, slightly irregular; hard, except at one or two places. History: Twelve years ago he had polypi removed from his nose by his own doctor. These recurred from time to time, portions being removed on twelve different occasions. Fifteen months ago he began to wear glasses, straight bar with nose-clips. Within a short time he found that the glasses did not fit, owing to a swelling beginning to form. There was no pain. The swelling gradually increased. Piece removed for examination. The pathologist reported carcinoma.

Sir STCLAIR THOMSON suggested that pathologists sometimes make mistakes. The swelling was symmetrical and not tender. Clinically, the patient has neither had spontaneous nor profuse epistaxis, such as one would expect. Malignant disease of the nose is not common in the opinion of those with large experience. Clinically, it was most unusual for a neoplasm to cause so many symptoms externally and so few internally. He suggested that Dr. Downie should again submit a further specimen to another pathologist.

Dr. WALKER DOWNIE replied that at first sight he thought the new growth might be a sarcoma. But when a fairly large piece was removed and examined the tissue was found to be carcinomatous in nature. The patient was seen in consultation with Sir George Beatson, who, impressed by the report and the position and size of the new growth, advised against operation. He would, however, adopt Sir StClair Thomson's suggestion and have another piece removed and examined.

Abstracts.

EAR.

Dench, E. B.—The Differential Diagnosis between Brain Abscess and Sinus Thrombosis and the Treatment of these Conditions. "The Therapeutic Gazette," August 15, 1912.

The author states that in cases of middle-ear suppuration one patient in eighty-eight suffers from some intra-cranial complication.

In brain abscess three stages are recognised:

(1) The *stage of infection*, which is acute, and lasts from two to ten days, and is characterised by high fever and rapid pulse.

(2) The *latent stage*, during which the temperature is normal or sub-normal, and the pulse-rate either normal or reduced in frequency. This stage may last weeks or years.

(3) The *terminal stage*, often with general symptoms from rupture of the abscess into a ventricle.

As regards the symptomatology, headache generally is persistent, and is severe enough to keep the patient awake. It is an early and significant symptom.

Vomiting is a symptom of great importance in the initial and

terminal stages. Muscular paralyses naturally depend on the position of the abscess; the sixth nerve is most frequently involved. Optic neuritis is of great importance in suspected cases. Aphasia and nystagmus are of value as localising symptoms.

The most characteristic symptom of a septic thrombus in the lateral sinus or jugular is a sudden elevation of the temperature, followed usually by a rapid fall, but sometimes this remission does not occur, repeated infections maintaining the temperature between 103° and 105° F.

Patients often complain of no discomfort except slight headache when the temperature is at its height. In the author's experience rigors are present in only half the cases. He has not found the cord-like swelling which is described by many observers as being present along the anterior border of the sterno-mastoid muscle, and considers glandular enlargement a symptom of greater importance. In later stages septic pneumonia is the most frequent complication, but septic foci may arise in any of the viscera; not infrequently optic neuritis may be found. The value of differential blood-count in these cases is exceedingly problematical, but a blood-culture, if "positive," practically clinches the diagnosis; a negative blood-culture, however, does not exclude sinus thrombosis.

When intra-cranial abscess has been diagnosed immediate operation is indicated, and the focus of suppuration should be attacked along the path of infection. A wide dural exposure including the original infected area should be made: an incision into the brain through the infected dura will usually enter the abscess cavity. A director passed into the brain will frequently evacuate a few drops of pus along the groove. For this purpose the author finds both the knife and the aspirating needle useless. Two narrow retractors are now passed into the abscess and separated, care being taken to evacuate the abscess slowly, so as to avoid reducing intra-cranial pressure too rapidly.

In opening a cerebellar abscess it is advisable to gain access in front of the lateral sinus unless this is placed too far forward. In some cases a counter-opening behind the sinus is needed to secure thorough drainage. In such cases a separate exposure of the cerebellum should be made, posterior to the mastoid emissary vein.

In cases in which the abscess cannot be located a free, crossed incision of the dura—a decompression operation—is advised and the subdural space should be packed with iodoform gauze. The abscess may then be discovered by incision twelve to twenty-four hours later. By this two-stage method the subdural space is walled off, and the risk of general meningeal infection is diminished.

Operation is equally urgent when sinus thrombosis has been diagnosed. The sinus should be exposed very freely. The signs usually given for detecting the presence or absence of clot in the sinus before opening it, though theoretically perfect, in practice admit of many exceptions. If the diagnosis is reasonably certain the sinus wall should be incised. Any obstructing thrombus should be removed, and the operator should not desist until free hæmorrhage from the torcular end of the sinus is obtained. In dealing with the lower end of the sinus the author is in favour of the same rule, *i. e.* to evacuate any clot by means of the curette, pressure being applied to the internal jugular in the neck, in order to prevent the entrance of air. If, however, the symptoms of general sepsis are severe the jugular is ligatured before exploring the lower end of the sinus. A positive blood-culture invariably indicates

jugular excision. The value of simple ligature of the internal jugular is problematical; cases doing well after it would probably have recovered without interference with the vein. In dealing with sinus thrombosis it is always better to err on the side of radicalism.

Knowles Renshaw.

NOSE.

Christie, N. A. (Welland, Ont.).—Nasal Diphtheria. "The Canadian Practitioner," January, 1912.

The patient, male, aged seventeen, was seen first on July 30, when diphtheria was diagnosed. The face was pallid, the tonsils and uvula covered with thick greyish membrane; from the nares issued a sanguino-purulent discharge, and cellulitis was so great about the angle of the right jaw that the upper and lower sets of teeth were not in line. The odour was characteristic of the disease.

During the first four days 18,000 units of antitoxin were administered. On the sixth day the membrane commenced to loosen in the throat. On the seventh day profuse hæmorrhage occurred from the right nasal passage, and, on forcible blowing of the nose, an almost complete cast of the mucous membrane on that side was ejected. This membrane was very tough, and nearly one eighth of an inch thick. To control the bleeding, a tampon soaked in solution of perchloride of iron was inserted. This was removed on the following day, when a similar cast from the left nasal passage was blown out.

From this time there was marked daily improvement until the twelfth day, when the heart's action became weak and irregular. This was followed by pharyngeal and general paralysis with all the usual symptoms of this complication. Treatment was by the ordinary methods in such cases, including iron, strychnine and electricity, but the patient did not fully recover until four months from the date of the attack.

Price-Brown.

THYROID GLAND.

Farrant, R.—Thyroid Action and Reaction. A Paper read before the Pathological Section of the Royal Society of Medicine on October 15, 1912.

The author said that the thyroid secretion was absorbed by way of the thyroid veins. These veins corresponded in size to the thoracic duct and right lymphatic trunk; they guarded the junction of the lymph with the venous circulation.

Certain toxins were absorbed by the lymphatics and passed up through the terminal lymph-trunks to come into immediate contact with the thyroid secretion. In these toxæmias a hyperplasia of the thyroid occurred without enlargement. This hyperplasia was illustrated by a series of slides taken from cases of infantile diarrhoea, diphtheria, measles, whooping-cough, broncho-pneumonia. So certain was this hyperplasia that in a given series the duration of the disease could be accurately arranged according to the degree of hyperplasia that had taken place. The reaction did not depend on the increased metabolism of febrile conditions, as it only occurred in certain diseases; for instance, infections with staphylococcus.

streptococcus, *Bacillus coli communis* produced no reaction even when accompanied by high fever.

Experimental Toxæmia and Antitoxic Action of the Thyroid.—The same hyperplasia could be produced in guinea-pigs by injection with diphtheria toxin; the reaction was mitigated if at the same time thyroid was administered by the mouth.

He found that guinea-pigs injected daily with sublethal doses, and also with a single dose one and a half times the minimal lethal, lived longer if given thyroid by the mouth than those not so fed.

The serum of a thyroid-fed rabbit was found to be slightly antitoxic to diphtheria toxin; the smallest dose of serum given in this series was .25 c.c.; it protected a guinea-pig of 270 g. from one and a half times the minimal lethal dose of diphtheria toxin. All the controls died.

Diphtheria antitoxin, when fed to a normal rabbit, produced symptoms similar to those of hyperthyroidism; the rabbit died in sixteen days, having lost 31 per cent. of its weight.

Rabbits fed on normal horse-serum developed no such symptoms and put on weight. Diphtheria antitoxin fed to thyroidectomised animals produced no ill-effect.

Observations on Antitoxin.—A series of sections of horse thyroids was shown that had been subjected to the effect of diphtheria antitoxin for one year. This series was arranged in the order of hyperplasia: the first section showed rows of cells arranged around small vesicles containing a little colloid, the last showed a colloidal thyroid with the cells squeezed together into rows between the larger vesicles. The direct transformation of the cells into colloid was seen in these sections. The antitoxic value of the serum was in the reverse order of the hyperplasia, the most hyperplastic thyroid corresponding to the lowest antitoxic value.

Relation between the Thyroid Hyperplasia, the Antitoxic Value, and their Iodine Value.—Hyperplasia varied inversely with the iodine content—Marine and Williams. The thyroid with low antitoxic value would thus show a low iodine value. From estimations on the iodine value of diphtheria antitoxin, he found that the antitoxic value varied with the iodine value. Normal horse-serum was found to contain but the slightest trace of iodine. Marine and Williams had showed that the physiological value of the thyroid varied with its iodine value.

Mr. Farrant put these results together: Certain toxins simulated the thyroid into a condition of hyperplasia, during this change it seemed probable that the iodine-containing substance was poured out into the circulation, for the serum of an immunised horse contained an excess of iodine, while the thyroid was hyperplastic. He assumed from the experiments of Marine and Williams that the thyroid itself became deficient in iodine at the same time. During the reversion back to the colloid, the iodine was once more taken up by the thyroid and it changed back to the colloid gland; the rate of change was directly proportional to the amount of iodine present.

Some close relationship was thus indicated between the thyroid function and the development of certain antitoxin. He suggested that perhaps the hyperplasia observed in these toxæmias arose from the attempt to form antitoxin.

The Formation of Thyroid Tumours: (a) Normal to Hyperplasia.—The toxins might be divided into the exogenous, producing endemic hyperplasia, the endogenous, producing sporadic hyperplasia. In both if the toxin was removed early no enlargement took place. The similarity between the hyperplasia produced by measles and broncho-pneumonia of

ten days' duration and exophthalmic goitre was shown; the only difference was that the early had not produced an enlargement whilst the late had produced an even enlargement of the thyroid.

(b) *Hyperplasia to Colloid*.—The reversion from hyperplasia to colloid was shown by a slide of early broncho-pneumonia and one dead three months after recovery. The similarity between the colloid reversion of an early and a late hyperplasia was shown. This deposit of colloid would be most marked in those portions of the thyroid that had been most hyperplastic; this would lead to the formation of adenomata; the rest of the gland might be in any degree of hyperplasia. During this involution degenerative changes were liable to occur, producing single or multiple cysts. The involution might go on to complete fibrosis.

Hyperplasia without thyroid enlargement.

Hyperplasia with various degrees of enlargement.

Adenomata of involution.

Cysts and cyst-adenomata of degeneration.

Fibrosis.

The formation of thyroid tumours in cretins.—Seventy five per cent of cretins had at one time or other thyroid tumours; the cycle of changes from hyperplasia to atrophy occurred in two to three years, when symptoms of cretinism developed. Two facts accounted for this rapidity of change. The toxin circulating in the blood of the fœtus would be relatively large in amount as it would correspond to the toxicity of the mother's blood. Secondly, the normal thyroid of a fœtus was already in a condition corresponding to that of hyperplasia, and owing to the delicate condition of the fœtal organs one would expect the changes from hyperplasia to atrophy to occur rapidly.

Author's Abstract.

REVIEWS.

Die Laryngealen Erscheinungen bei multipler Sklerose des Gehirns und Rückenmarks (The Laryngeal Manifestations in Multiple Sclerosis of the Brain and Spinal Cord). By Privatdozent Dr. L. RÉTHI (Vienna). Pp. 148. Vienna: Josef Saffar, 1907.

The relations of "special" symptoms to general diseases are always of the greatest interest to the specialist who respects his special department, and who is too conscientious to run the risk of overlooking the real nature of the more obscure of the conditions affecting the parts of the body with which he is particularly, or, it may be, exclusively occupied. It is when the special symptoms are the first to show themselves, and the signs of the general disease are not developed sufficiently for its nature to be recognised by the non-expert, that the interest and the importance of their correct interpretation are most marked. Occasionally disseminated sclerosis is ushered in by laryngeal symptoms, such as hoarseness (p. 27), but this is unusual. It cannot, indeed, be said that laryngeal paralysis is a common occurrence in disseminated sclerosis, but fluctuating degrees of disturbance of mobility of the cords are fairly frequent. Rethi in his monograph analyses the various laryngeal and vocal disturbances very thoroughly by an exhaustive study of the cases published by other authors, enhanced by his observations on his own cases. In general it may be accepted that the various disturbances in the action of the laryngeal muscles are phenomena of weakness rather than of paralysis. The work is strictly objective and devoid of anything in the way of padding. Its study will provide the laryngologist with the means of

avoiding many possibilities of error, such, for instance, as the common mistake of diagnosing multiple sclerosis as hysteria. The sources of information quoted include a number of British writings, and the names of our countrymen figure more largely in the list of authors than in many foreign works. It is pleasant to see this, and it is creditable to the illustrious author.

Dundas Grant.

Practical Guide to the Diseases of the Throat, Nose and Ear. Third Edition. By WILLIAM LAMB, M.D. (Birmingham). London: Baillière, Tindall & Cox, 1913.

Dr. Lamb's guide is a living work, and illustrates the dictum that "where life is, growth should be." The demand for a third edition in five years after the issue of the second is a normal one, and in the interval Dr. Lamb has evidently been on the look-out for good things to add to the many already contained in the book. Among these he signalises the consideration of oral sepsis (p. 9), the occasional risk attending the tonsil and adenoid operation (p. 64), tonsillectomy (p. 71), the submucous resection of the septum (p. 170), the intra-nasal operation for chronic antral suppuration (p. 185), danger signs in ear disease (p. 286), the conservative mastoid operation (p. 326), and the examination of the labyrinth (p. 290). In regard to all these there has been much discussion, and, on the whole, a considerable amount of progress during the last few years. Dr. Lamb has indicated the most salient points in the practical and concise way characteristic of his work. We are glad to see a reference to pneumococcal invasion of the throat (p. 18). The description of the submucous septal operation is wonderfully good, considering the space allowed for it; but the writer frankly admits the advisability of referring to more detailed accounts of it (p. 173). There are, however, some hints of Dr. Lamb's own which are worthy of special attention. The same remarks apply to the frontal sinus operation. There are some good hints in regard to laryngeal tuberculosis and some formulæ culled from the latest writings on the treatment of this distressing ailment. Those who have not made a special study of diseases of the throat, nose and ear will find this an eminently practical guide, and those who have made such a study will find in it many hints worth accepting for their own guidance, as well as for the instruction of their pupils.

Dundas Grant.

OBITUARY NOTICE.

E. W. ROUGHTON, M.D., B.S.LOND., F.R.C.S.ENG.

WE regret to announce the death of Mr. E. W. Roughton, which took place on June 10 at the early age of fifty.

Mr. Roughton, who had been for several years surgeon to the Royal Free Hospital, had charge of the Throat and Ear Department of that institution, and although the demands made upon his time and energy by general surgery were very considerable, he nevertheless applied himself with assiduity to the more special work, and became an operator of great skill and success in ear and nose cases.

Mr. Roughton, who was a St. Bartholomew's Hospital man, had a distinguished career as a student, and much of the promise of his early years reached fruition in later life, and had he been spared to continue his work he would, doubtless, have achieved even higher distinction.

As a teacher Roughton was direct, forceful and impressive, and many stories are told illustrative of his gift of epigrammatic diction.

His last illness was tedious and prolonged, but Roughton, although he had been for long aware of its fatal character, faced the hopelessness of his condition with a heroic fortitude which evoked the admiration of all who knew him.

ADDENDUM TO THE CLINICS OF BRITAIN FOR DISEASES OF THE THROAT, NOSE AND EAR.

The Leeds Public Dispensary (Ear, Nose and Throat Clinic).

Medical Officer.—Alexander D. Sharp and one Clinical Assistant.

Out-patients.—1298. Tuesdays and Wednesdays, 2.30 p.m.

Operations.—*Major*, Mondays, 2.30 p.m. *Minor*, Tuesdays and Fridays, 9.30 a.m.

Instruction.—Post-graduate by arrangement.

Leeds Consumptive Hospital, Armley (Nose and Throat Clinic).

Medical Officer.—Alexander D. Sharp.

Beds.—None allotted. *In-patients*, 187. Thursdays, 9.30 a.m.

Operations.—As required.

Leeds Consumptive Dispensary, Great George Street (Nose and Throat Clinic).

Medical Officer.—Alexander D. Sharp.

Out-patients, 284. Wednesdays, 10 a.m.

Operations—As required.

Note.—We regret the accidental omission of the above-named Clinics from the list given in the August number.

By a clerical error, also, the name of Dr. Milligan was omitted from the staff of the Manchester Ear Hospital, for which we beg to express our regrets

BOOKS RECEIVED.

Asthma and its Radical Treatment. By *Jas. Adam*, M.A., M.D., F.R.F.P.S., Hamilton. Dispensary Aural Surgeon, Glasgow Royal Infirmary. With four illustrations. London: Henry Kimpton, 1913. Price 5s. net.

The Tonsils and the Voice in Science, Surgery, Speech and Song, etc. By *Richard B. Faulkner*, M.D. Columbia University: The Presbyterian Book Store, Pittsburgh, Pa.

Diseases of the Ear. By *Philip D. Kerrison*, M.D., Professor of Otology, New York Polyclinic Medical School and Hospital. 331 Illustrations in Text and two full pages in colour. Philadelphia and London: J. B. Lippincott Co., 1913. Price 21s. net.

Handbuch der Speziellen Chirurgie, etc. 3 Bd., Lieferung 6. *Drs. L. Katz, H. Preysing, F. Blumenfeld.* Würzburg: Curt Kabitsch, 1913.

THE
JOURNAL OF LARYNGOLOGY,
RHINOLOGY AND OTOTOLOGY.

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TWO CASES OF SUBGLOTTIC TUMOUR.

BY SIR ROBT. H. WOODS, M.B., M.Ch.(*Hon. Causa.*), F.R.C.S.I.,
Dublin.

THE literature of tumours originating below the rima glottidis is still scanty enough to justify me in recording the following cases.

T. L—, a bright boy, aged eleven, was sent to me on April 10, 1912, by Drs. Kelleher and Morris, of Waterford, complaining of difficulty in breathing. He had been perfectly well until two months before I saw him, when he got an attack of bronchitis. Since this attack his breathing had grown steadily more and more laboured, becoming at times so distressing that the mother could only describe it as "almost a fit," though there was no suspicion that she used the word in its literal sense.

On examination the voice was natural. There was well-marked dyspnoea both on inspiration and expiration, the sound being of that peculiar character caused by tracheal obstruction. The supra-sternal notch showed some sinking during inspiration.

The family history was unimportant. Careful inquiry was made as to the possibility of a foreign body having been inhaled, and it was said in reply, that the first attack of bronchitis took place after eating periwinkles, and it might have so happened that a piece went the wrong way. I thought this unlikely. The stridor was

heard with the stethoscope equally well on both sides of the chest. There was very little cough, and the boy's colour and general appearance were good, though he looked anxious.

They consented to bronchoscopy, which I endeavoured to perform under cocaine, but the boy's terror, increased by his distress, made it impossible. I accordingly sent him to a nursing home, and the following morning carried out that procedure under general anæsthesia supplemented by cocaine locally. I saw a fun-

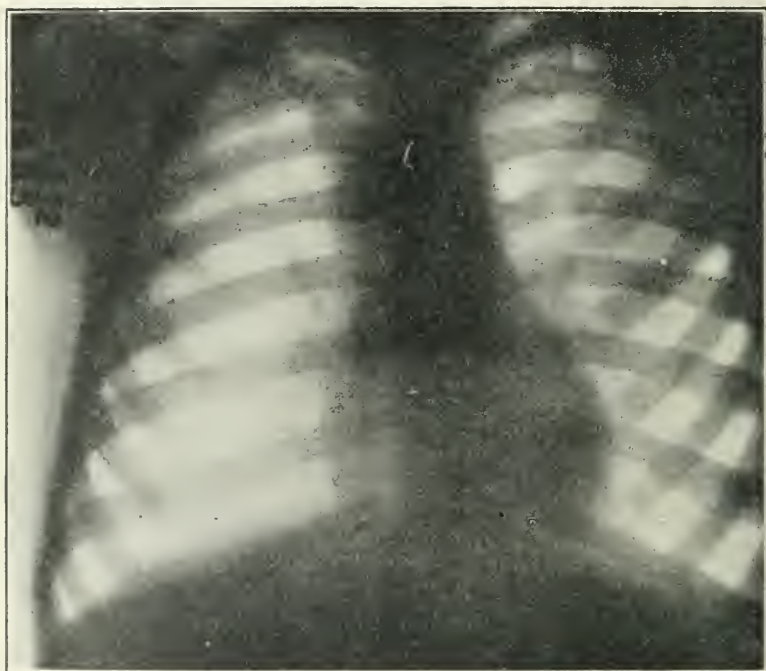


FIG. 1.—Case 1: T. L.—. First skiagram taken April 12, 1912, showing opacity of glandular structures at bifurcation of trachea.

gating granulomatous tumour growing from the right wall of the trachea immediately above its bifurcation. The air-passage was reduced at this point to a small crescentic opening at the left side. There was no general bulging or swelling of the wall, or any other sign of invasion by a tumour originating outside the passage. Several pieces of the growth were removed by forceps. Bleeding, though by no means profuse, was persistent enough to keep the field obscured, and I knew there was still some tumour left when I had done all I then could.

The pieces removed were sent to Dr. Earl, who reported them to be granulation-tissue, and very vascular. I next sent the boy to Dr. Watson for X-ray examination. He reported that the glands at the bifurcation of the trachea were enlarged and very opaque to X rays. This feature is very well seen in the print, but by no means so well as at that time on the screen.

The boy was enormously relieved by the operation, but on deep respiration there remained more than a suspicion of the former stridor.

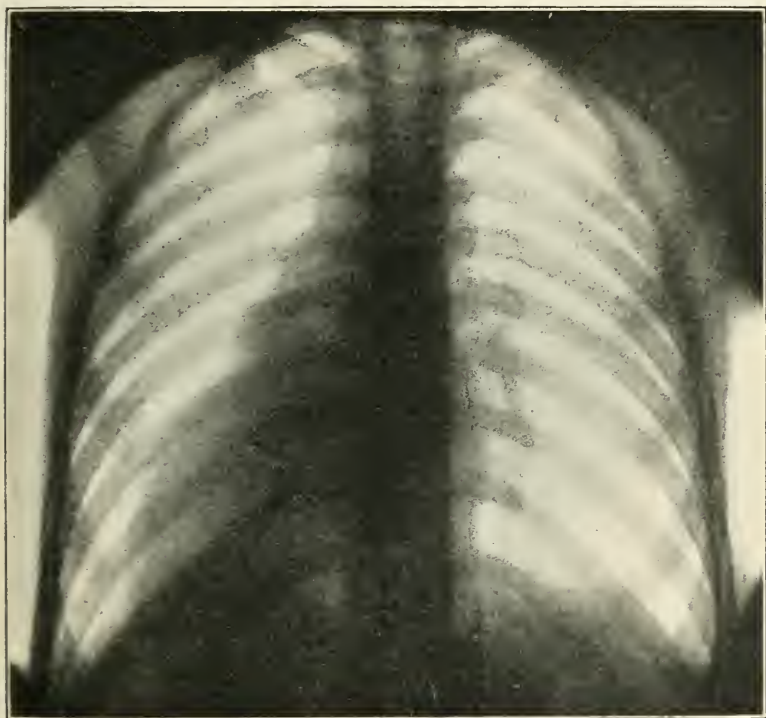


FIG. 2.—Case 1: Second skiagram taken November 27, 1912, seven and a half months after operation. O. acity which formerly existed at bifurcation of trachea no longer present.

On May 7, *i. e.* nearly four weeks after his first bronchoscopy, I performed it a second time. I had by this time gained the complete confidence of the boy, and had no difficulty in passing the instrument under local anæsthesia. The tumour was much smaller than before. The portions removed were again submitted to Dr. Earl, who again reported granulation-tissue. The patient was quite undisturbed by the operation, and could breathe deeply ten days later without any abnormal sound catching the ear.

Bronchoscopy was carried out a third time on June 12, also under local anæsthesia. The tumour was found as a mere flattish elevation interfering in no way with the breathing space. The last of it was then removed. Dr. Earl again reported it to be "a rounded-celled growth with many blood-vessels and apparently granulation tissue."

The patient then returned to Waterford.

I again saw him on November 27, between seven and eight months after the first operation. I passed the bronchoscope but could find no trace of the growth. He was in every respect well

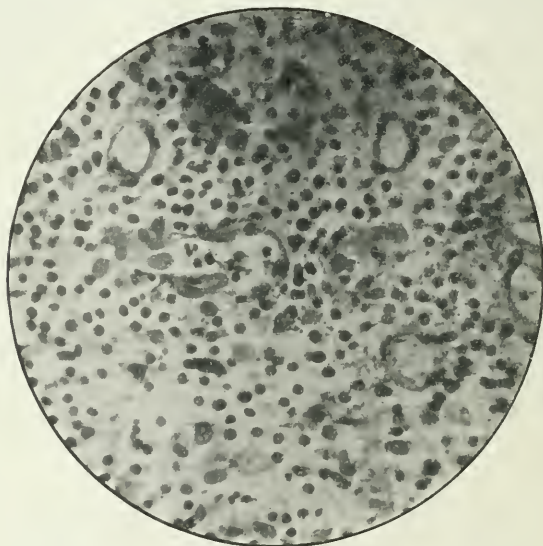


FIG. 3.—Case 1: Granulomatous tumour of tracheal wall.

and had improved greatly in health. I sent him the same day to Dr. Watson, who could find no trace of the glands either by screen or plate. The print shows a normal thorax, and is a strong contrast to the one taken when he first came to Dublin. The plates are taken from different aspects, but this does not affect the contrast.

The pathology of this case presents some difficulties. The whole case is explicable if we assume a septic wound of the tracheal wall, but it is hard to see how sufficient force could be exerted except by a foreign body large enough to be impacted, in which case the opposite wall could hardly escape without lesion, if, indeed, the impaction did not cause suffocation.

The second case is that of a man, aged forty, who for some years suffered from slight difficulty in breathing. At first this was so slight as hardly to be noticeable, but as time went on his breathing became noisy, especially when he had a cold on the chest. The family history was good, and he never suffered from illness of any kind. The man was otherwise healthy and well nourished.

On examination there was well-marked stridor of the tracheal type. With the laryngoscope a tumour could be seen below the vocal cords, apparently filling the lumen of the trachea, but its attachment could not be located. Both vocal cords moved fully, and the voice was unaffected.



FIG. 4.—Case 2: Malignant tumour of trachea.

On passing a bronchoscope under local anaesthesia the growth was found to be attached by a broad base to the anterior part of the larynx or windpipe below and clear of the vocal cords. A piece was removed by a forceps for microscopic examination. Prof. O'Sullivan, to whom it was submitted, reported as follows: "The growth consists of solid cell masses and of spaces lined with cells. The spaces are either empty or contain homogeneous material. The tumour is certainly malignant, but is not an ordinary squamous cancer. It may be a cancer arising from a mucous gland." No enlarged glands or external evidence of its presence could be seen or felt. Operation was recommended, and carried out on

November 22, 1912, with the assistance of Prof. Edward Taylor, who had in the first instance transferred the case to my care.

Breathing had become so laboured a night or two previous to the day of operation that the house-surgeon was prepared for tracheotomy, which he regarded as imminent.

Bearing in mind the tendency of patients with tracheal obstruction to choke during induction of general anaesthesia, I adopted the precaution of first passing a small brass tube through the constriction under local anaesthesia, with the help of the bronchoscope. A silk string was attached to this tube for safety and for purposes of withdrawal.



FIG. 5.—Case 2: Malignant tumour of trachea.

Ether was then administered with great comfort, and the larynx and upper portion of the trachea exposed. No sign of the tumour was visible externally.

The isthmus of the thyroid gland was divided. Tracheotomy was performed below the tumour, and chloroform administered through the tube. The larynx was then divided in the middle line, and the tumour found to be growing from the posterior aspect of the front of the cricoid ring.

It was quite discrete, and we found no great difficulty in detaching it from its base by a sharp dissector. The surface of the cartilage was quite clean, and the perichondrium obviously not invaded.

The patient made an uneventful recovery from the operation, but was unlucky enough to develop typhoid fever ten days afterwards, probably from an infection obtained before coming into hospital, as no other case occurred. In the middle of February when his temperature had been normal for a considerable while after the typhoid, he developed cholecystitis and typhlitis, for which an operation was performed on February 19. He succumbed two days later.

Post-mortem examination showed the larynx and trachea perfectly healed, and I am in a position to show both the tumour and its site after healing had taken place.

NASAL THERMOMETRY: A METHOD OF DETERMINING THE INFLUENCE OF THE NOSE ON THE TEMPERATURE OF THE INSPIRED AIR.¹

By A. BROWN KELLY, D.Sc., M.D.,

Surgeon for Diseases of the Throat and Nose, Victoria Infirmary, Glasgow.

SOME of the most puzzling cases with which the rhinologist has to deal are dependent on disturbances of the respiratory function of the nose. I do not allude to conditions associated with marked nasal obstruction, but to those less obvious varieties in which the patient breathes entirely or almost entirely by the nose. Many of the subjects of the affections to which I refer indignantly deny that they have any nasal trouble.

The principal diseases falling within the class indicated are—intermittent nasal obstruction and deviation of the septum. The symptoms in these affections traceable to defective warming of the inspired air usually manifest themselves as pharyngeal irritation, sometimes exciting cough, and susceptibility to attacks of acute or subacute inflammation in the naso-pharynx, pharynx, larynx or lower air-passages. With the disorders of secretion that may also arise I shall not at present deal.

In the hope of adding to our knowledge of the physiology of nasal respiration and of throwing additional light on the subject I have studied off and on for several years the temperature of the air after it has passed through the nose.

All the experiments have been carried out with extremely delicate mercury thermometers made by Mr. Zeal, London, to

¹ Read at the meeting of the Scottish Otological and Laryngological Society, May, 1913 (see p. 551).

whom I am indebted for the trouble he has taken to meet my requirements.

The thermometer has a twin bulb. Its stem is sufficiently long so that when the instrument is *in situ* the portion with the scale projects beyond the nose or mouth. The scale ranges from 75° or 80° F. to 100° or 105° F., and indicates half degrees. The sensitiveness is such that the mercury immediately responds to the slightest rise or fall in temperature, so that when used for testing the respiratory current in the naso-pharynx the alternate changes



FIG. 1.

produced by the colder inspired air and the warmer expired air are at once evident.

At first I used a straight thermometer. This was introduced along the floor of the nose so that the bulb projected into the naso-pharynx. The chief objection to this instrument was that its presence in the nose cut off a certain amount of the respiratory current and thus altered the normal conditions.

The next step was to employ a thermometer having a long stem

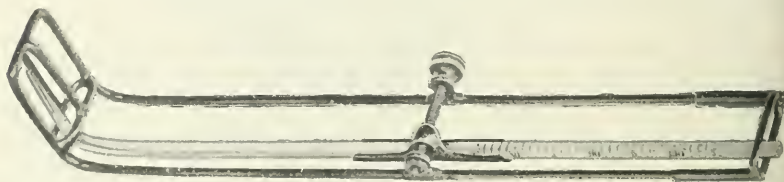


FIG. 2.

with the bulb bent upwards at a right angle. When in position the bulb was in the naso-pharynx and the end of the stem with the scale projected from the mouth. Various difficulties were now encountered: the chief was the uncertainty as to the exact position of the bulb; there was also the danger of the glass breaking.

In order to remove these objections and to allow of the comparison of the temperatures on the two sides of the nose a holder for two thermometers was designed (Fig. 1). This was so constructed that the bulbs could not come into contact with the

mucous membrane, and each was opposite, or nearly opposite, the middle of the corresponding choana.

After many experiments had been made with this double holder and various sets of thermometers, it was found impossible to get a couple exactly alike as to the temperature registered and the amount of excursus.

A single holder consequently was next devised (Fig. 2). It has proved satisfactory, and the results reported in this paper were obtained while it was in use. This pattern allows of the thermometer being moved from side to side of the naso-pharynx as desired. It consists of a rigid wire framework, which, like the thermometer, has its end bent upwards at a right angle to enter the naso-pharynx. A screw forms a bridge between the two sides of the framework, and when the instrument is in position crosses in front of the mouth. On this screw a spring clamp which grips the thermometer travels. The end of the holder which enters the naso-pharynx serves both to protect the thermometer and to prevent it from touching the lining membrane. The other end of the holder can be slipped off and on; the loop encircles the thermometer stem and keeps it in position. The movements of the magnified column of mercury can be easily watched and the scale read by one standing on the patient's right and looking down.

When it is desired to take temperatures the soft palate and posterior wall of the pharynx are painted with cocaine. The thermometer is placed in the middle of the holder so that the bulb is protected in front and behind by the vertical bars of the cage. The instrument is introduced and the vertical bars come to lie behind the posterior edge of the septum. The screw is now turned until the bulb of the thermometer is opposite the middle of one choana. The patient is requested to close his teeth and lips on the instrument and to breathe quietly and regularly through the nose.

The observer stands on the patient's right and gives him a minute or two to accustom himself to the instrument. Meanwhile he watches the movements of the mercury, and as soon as these become fairly uniform, he reads off the highest and lowest points reached during each expiration and inspiration for a period of one minute. A nurse notes the numbers.

If the patient has breathed steadily, and a satisfactory record for one minute of the temperatures of the respiratory current behind one choana has been obtained, the test should be repeated for the other nasal fossa. This is done without removing the

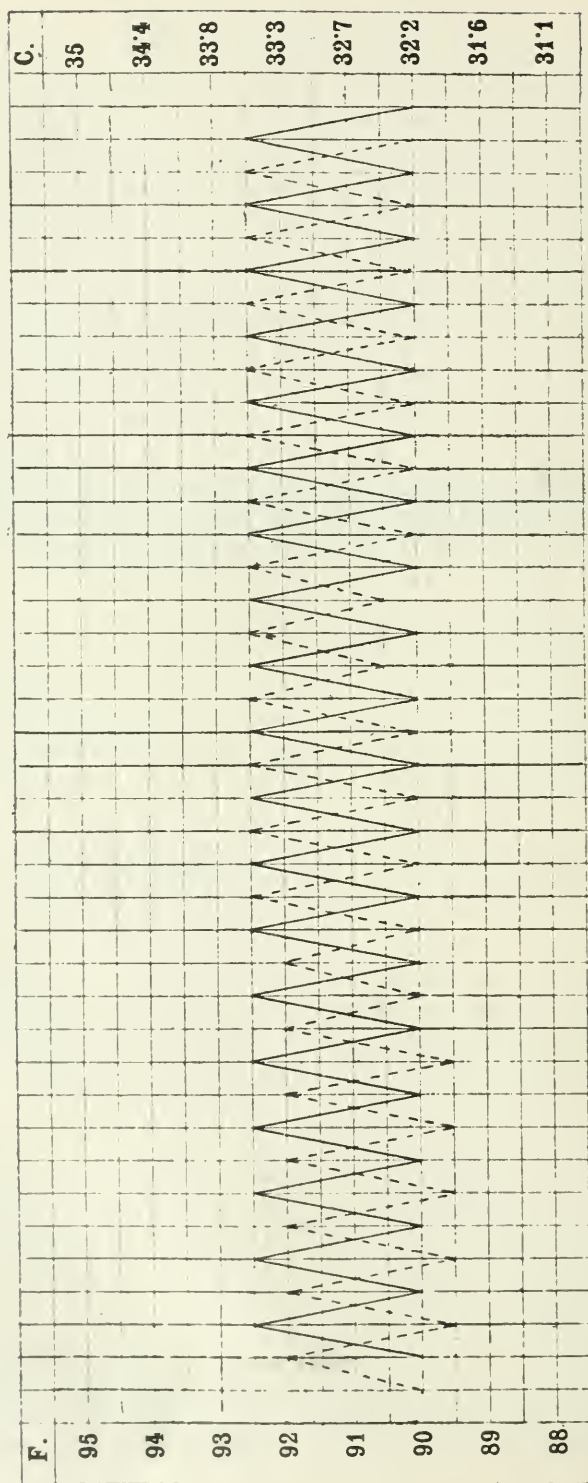


FIG. 3.—Normal nose, 20 respirations per minute. Average on right side (dotted), 90-92.5; excursions, 2.5. Average on left side, 90-92.5; excursions, 2.5.

instrument from the mouth, by merely turning the screw until the bulb is opposite the middle of the other choana, and then noting the temperatures as already described.

The temperatures may be graphically recorded as shown below.

Individuals differ considerably as to their suitability for this test. Some are too irritable and retch, others breathe irregularly from nervousness, and in others too profuse secretion causes

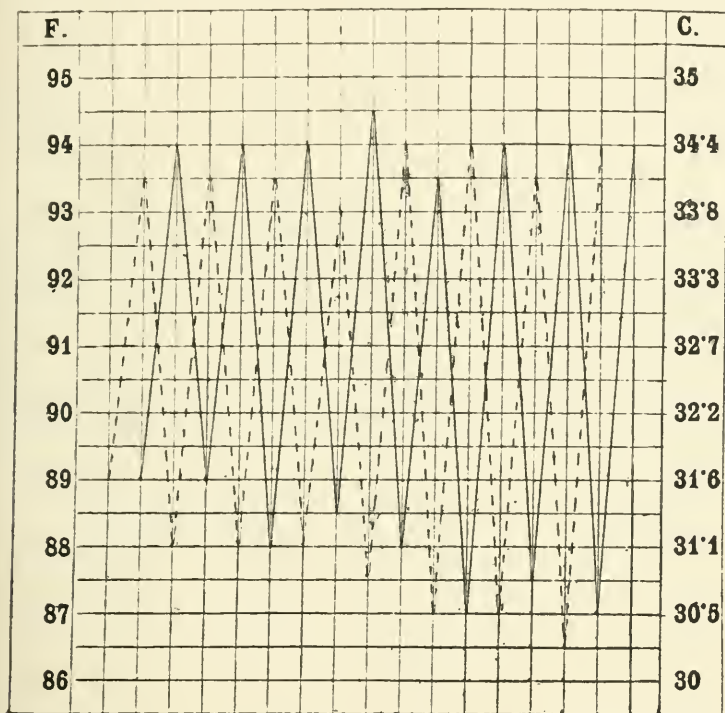


FIG. 4.—Normal nose, 8 respirations per minute. Average on right side (dotted), 87.5° - 93.5° ; excursus, 6° . Average on left side, 88° - 94° ; excursus, 6° .

frequent deglutition. Mucus occasionally envelops the bulb and stretches between it and the cage. Its presence should be suspected if the oscillations seem sluggish. There should be no appreciable interval between the change in direction of the respiratory current and the corresponding change in the movement of the mercury column.

If the movements of the mercury are watched it soon becomes obvious that the amplitude of oscillation bears a direct relation to the depth of the respiration. Shallow rapid breathing produces a

short excursus, while deep, slow breathing produces one of greater amplitude. Thus, 20 respirations per minute are accompanied by oscillations on an average of fully 2° , while 8 respirations per minute may give a variation of 6° (Figs. 3 and 4).

From a large number of observations it has been found that in the normal nose—

8	respirations per minute	give an average excursus of	6° F.
9	"	"	" 5°
10	"	"	" 4.5°
11	"	"	" 4°
12-15	"	"	" 3.75° - 3°
16-22	"	"	" 2.75° - 2°
23-27	"	"	" 1.75° - 1.5°

It should at once be pointed out that these numbers are of relative value only. They were all taken with the same instrument; a slower thermometer would indicate a smaller excursus, and *vice versa*.

The effects of abnormal patency of the nose on the excursus are most apparent in cases of deviation of the septum. In the subjoined table are noted the results obtained by testing a series of such cases:

Number of respirations per minute.		Normal average excursus.	Deviation of septum. Excursus behind—	
			Wide fossa.	Narrow fossa.
7	.	7°	.	5.5°
9	.	5°	.	1.5°
12	.	3.75°	.	5°
13	.	3.5°	.	3.5°
14	.	3.25°	.	3.5°
14	.	3.25°	.	2°
14	.	3.25°	.	4.5°
14	.	3.25°	.	1.5°
15	.	3°	.	2.5°
16	.	2.75°	.	1°
17	.	2.5°	.	1°
20	.	2.25°	.	2°

From the above table three facts may be deduced in regard to cases of deviation of the septum: (1) The excursus on the wide side is almost always greater than normal. (2) The excursus on the narrow side is usually less than normal. (3) In every case the

excursus is greater on the wide side than on the narrow side, and occasionally strikingly so (Fig. 5).

A similar but less marked result is obtained when the unequal patency of the nasal fossæ is due to enlargement of one inferior turbinate (Fig. 6).

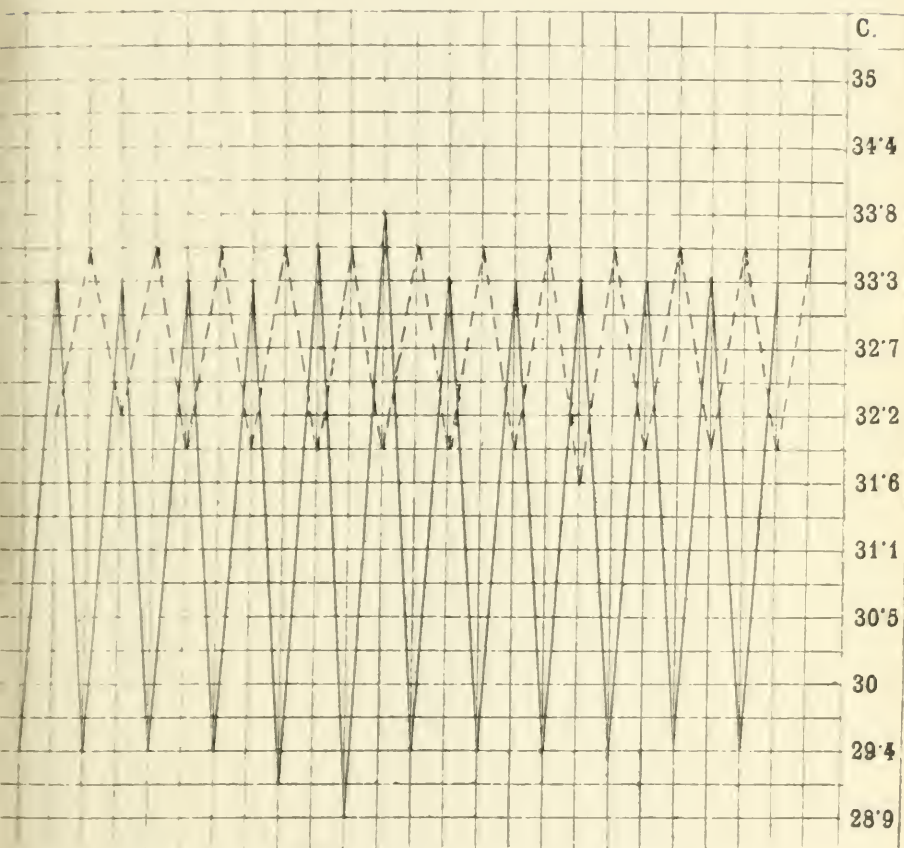


FIG. 5.—Deviation of septum to left, 12 respirations per minute. Average on wide side (right); 85° – 92° ; excursus, 7° . Average narrow side (left) (dotted), 89.5° – 92.5° ; excursus, 3° .

The widening of a nasal fossa by cocaine and adrenalin is followed by an increase of $\frac{1}{4}^{\circ}$ to 1° in the excursus.

On the other hand, mere width of the nasal fossæ does not in itself give a large excursus. In atrophic rhinitis the excursus tends to be smaller than normal (Fig. 7), as the following table of cases shows:

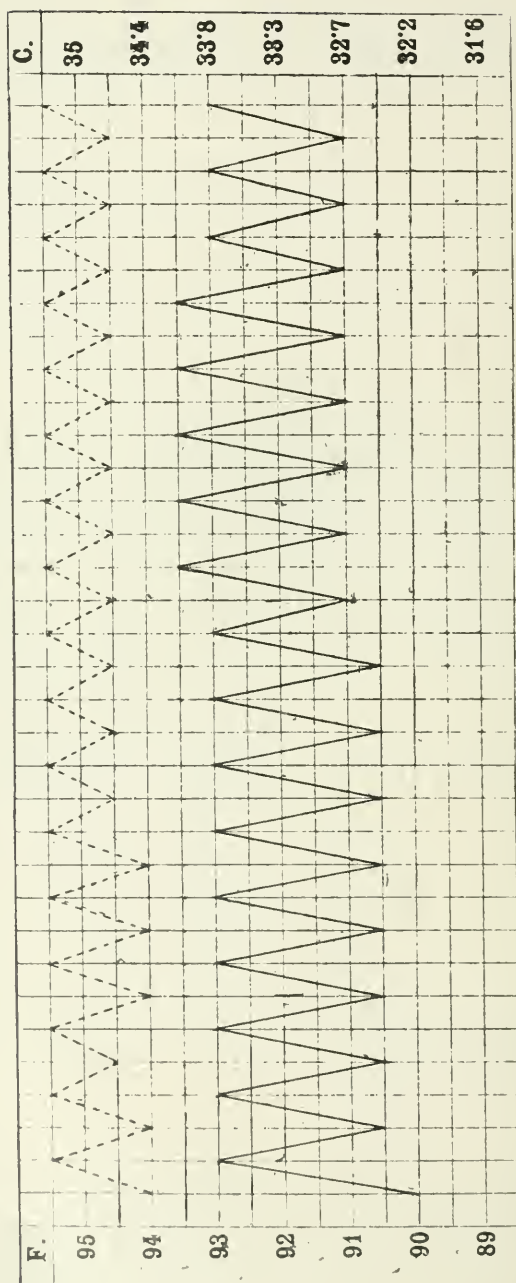


FIG. 6.—Enlarged right inferior tubinal, 17 respirations per minute. Average on normal side (left), 90.75°-93.25°; excursus, 2.5°. Average on obstructed side (right) (dotted), 94.5°-95.5°; excursus, 1°.

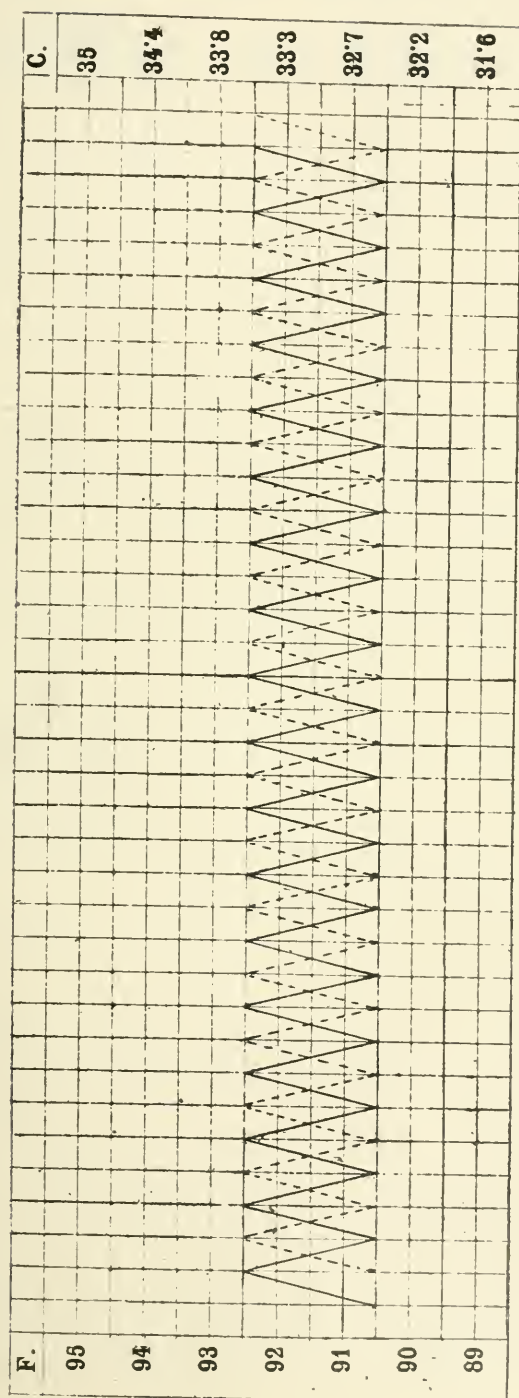


FIG. 7.—Atrophic rhinitis (moderate), nasal fossae equal, 18 respirations per minute. Right and left side, 90.5° – 92.5° ; excursus, 2° .

Number of respirations per minute.	Normal average excursus.	Excursus in atrophic rhinitis: each side is noted.
13 . .	3.5° . .	3°, 3.5°
15 . .	3° . .	2.5°
16 . .	2.75° . .	2°
17 . .	2.5° . .	2°
18 . .	2.5° . .	2°, 2°, 2°, 2°, 2°
19 . .	2.25° . .	2°
20 . .	2.25° . .	2°, 2°
21 . .	2° . .	2°, 2°, 2°
25 . .	1.5° . .	1.5°
26 . .	1.5° . .	1.5°

In unilateral obstruction the abnormal lowering of the temperature on the wide side is due to the air passing through the corresponding fossa in larger volume per unit of time, and with greater rapidity than normal.

The temperature of the respiratory current in the naso-pharynx, as noted by the method described, is not to be attributed solely to the warming action of the nose and naso-pharynx; allowance must also be made for the influence of the expiratory current. With a room temperature of 60°, if a very deep inspiration be taken the mercury will fall to about 80°; and if a stream of air be blown along the nose it can be lowered to 75°. On the other hand, a full expiration can raise the temperature to 96°. The temperature indicated during ordinary respiration, therefore, is the mean resulting from the commingling of the current of cool inspired air with that of warm expired air.

The determination of this mean has been carried out as follows: The highest and lowest point reached by the mercury during each respiration over a period of one minute has been noted, the average of this series has been calculated, and the middle point of the average taken. The middle point in a large number of cases has been thus worked out, and, on taking their average, it has been found that when the nose is normal the temperature of the respiratory current in the naso-pharynx is between 90.5° and 92.5°. It is probably more correct to state it thus than to give a fixed point, viz. 91.5°, as the temperature varies between these limits in consequence of slight intra-nasal and other variations (*vide infra*) which would not attract attention, and certainly could not be regarded as pathological.

In atrophic rhinitis, the temperature calculated in the same way

is slightly lower, the average being 90.75° . In deviation of the septum the average temperature on the wide side is 89.5° , and on the narrow side 91.5° ; these results were obtained from unselected cases.

I give these figures with some hesitation, for the subject is extremely complex. In proof of this, some of the conditions that influence the temperature of the respiratory current in the naso-pharynx are briefly enumerated:

(1) There appear to be individual differences. Some subjects habitually register lower temperatures than normal, while others register higher temperatures.

(2) The temperature of the external air: All the observations here recorded were made at temperatures between 55° and 65° F.

(3) The depth of the respiration: Increase in the amplitude of the excursus is usually both in an upward and downward direction, but chiefly in the latter when the excursus is great.

(4) With collapse of the inferior turbinate and widening of the inferior meatus there is a fall in the temperature of both the inspiratory and expiratory stream, but especially of the former.

(5) If the inferior meatus is obstructed, but the upper part of the nose is free, the temperature rises above the normal.

(6) If the middle meatus is obstructed, but the inferior is free, the temperature is at, or below, the normal.

(7) The position of the thermometer in the naso-pharynx. The temperature is lower about the middle (*i. e.*, near the septum) than towards the sides of the naso-pharynx; it is also lower on a level with the floor of the nose than towards the roof of the naso-pharynx.

(8) The condition of the other nasal fossa. When the nasal fossæ are unequal, the temperature behind the wide chamber is below normal, while that on the narrow side is at, or usually above, normal.

The method described affords a ready means of testing the influence of the nose on the temperature of the respiratory current. It is evident from what has been stated that one may find slight differences not only between the temperatures taken in a number of apparently normal noses, but even in those noted in the same nose over a period of a few minutes owing to the varying rate of respiration, the changes in bulk of one or other inferior turbinal, etc. The excursus is worthy of attention in that its amplitude,

when taken in conjunction with the number of respirations per minute, seems to be a reliable index of the volume and speed of the air-current passing through the nasal fossa under observation.

WHAT BECOMES OF SINUSES THAT HAVE BEEN OPERATED ON?

BY PROF. E. J. MOURE,¹
Bordeaux.

Translated by DAN MCKENZIE.

THE operations which are performed upon the accessory cavities of the face have, during the last few years, passed through several successive phases, particularly interesting from the point of view of their evolution. Thus, in the radical cure of maxillary antrum suppuration a number of partisans have sprung up, who are hotly convinced of the value of endonasal operation (either through the middle or through the inferior meatus), and, in France particularly, drainage of the antrum through the enlarged natural orifices still enjoys a certain amount of favour.

Some practitioners (Mahu, Vacher) have, indeed, added to the simple opening of the antrum of Highmore a more or less incomplete curettage of its cavity by means of bent curettes, but it must be admitted that by this route it is difficult to reach all the nooks, crannies and anfractuositities of a cavity often very roomy, angular, and even septate.

The operation through the canine fossa (Caldwell-Luc), more or less modified in detail by its originators as well as by a considerable number of practitioners, nevertheless still remains the operation of choice, at all events for refractory cases of maxillary sinusitis.

What I am about to say will, I believe, furnish a decisive argument to those who favour the radical cure, now that local anaesthesia by means of cocaine has rendered it so much more simple and easy to perform.

With regard to frontal sinus suppuration, I shall not discuss the methods which consist in treating and even in curing it at times through the natural route. I am convinced that these

¹ Read at the Laryngological Section of the International Congress of Medicine, London, August, 1913.

methods in the hands of some of the practitioners who have tried them have afforded decidedly encouraging results, at least for the time being. I have already said elsewhere why I think that this method cannot become generalised. For, even in the opinion of those who have extolled this method of treatment, there exist cases in which recurrence to external operation is imperative, and here again specialists are not all agreed upon the *modus faciendi*.

Many consider that, in order to clear out a frontal sinus satisfactorily, full exposure by destruction of its entire anterior wall (Kuhnt's procedure) is indispensable, with the object, as the promoter of this method has said, of bringing the skin into contact with the internal wall of the sinus in such a way as to lead to the complete occlusion of its cavity. Killian, going a step further, in order to obtain this apparently indispensable fusion, has advised his operation, the technique of which everybody knows and of which I do not need to remind you.

In reality, all these interventions have been conceived and executed with the object of obliterating the frontal sinus as completely as possible. Now, we all know perfectly well, first, that this ideal obliteration cannot be realised in many cases; secondly, that in spite of the persistence of certain so-called "dead spaces," our patients nevertheless become completely and finally cured; thirdly, that the only point of vital importance is the extinction of the too long neglected ethmoidal lesions. For the frontal sinus operations, however seriously and thoroughly executed, tend to lessen but not to dry up the suppuration, since the infected ethmoidal cells continue to pour pus into the infundibular canal.

The majority of writers have, in the same way, thought that it is essential to secure constant fronto-nasal drainage by enlarging to its utmost the canal which connects the sinus with the interior of the nose, and upon this drainage, they suppose, the certain cure of the patient ultimately depends.

I am quite convinced, and have been so for a long time, that these different ideas were, and are, more theoretical than practical. For many long years I had lasting successes from the simple radical operation with the external wound of the smallest possible dimensions, and, like many of my *confrères*, it was while I was seeking to open the frontal and ethmoidal cavities widely that I encountered failures, disappointments and even accidents. For this reason I did not hesitate to recur to the earlier methods, that is, to the ideal operation of Ogston-Luc, to which, to be candid, I added, when it

was called for, the exenteration of the ethmoidal cells—the anterior generally, and less often the posterior.

At the present moment my already considerable experience has absolutely convinced me that if the frontal sinus is well and thoroughly curetted, that is to say, if the whole of its investing mucous membrane is removed, even when this clearance is effected through a small-sized opening, if the accessory cells (in general retro-nasal) which lie behind the nasal bones (*derrière les os propres*) are opened and curetted carefully, and finally if the ethmoid is disinfected conscientiously, fronto-nasal drainage need not be so free and so persistent as many people have desired it to be.

Indeed, a knowledge of what happens to the cavities thus emptied and cleansed is all that is necessary to enable us to understand the importance of the fact I am now placing before you. On those occasions when I had to open afresh frontal and maxillary sinuses which had already been operated on—either because I had left some diverticular or aberrant cells which had continued to suppurate, or because I had not curetted the ethmoid completely—I could easily observe that antra which had been very roomy at the first operation *no longer existed, so to speak, when I came to operate for the second time. All the cavities had become filled up* with a kind of fibrous tissue; even the bony walls had come nearer to one another, so that the sinus had, in a measure, disappeared. There was nothing left, in fact, but the suppurating cells which, in order to cure my patient completely, I had had to follow after.

This fact—the cicatricial obliteration of the sinuses—aroused my attention, and it was a short step from that to the conclusion that it was quite unnecessary to leave the naso-frontal canal wide open since it could no longer drain a non-existent cavity.

Moreover, if operated sinuses close and fill up, why perform operations as extensive and disfiguring as those of Kuhnt and Killian? Is it not now quite clear that, if we wish to operate on and cure a sinusitis, all that is needed is an opening large enough to enable us to inspect the interior adequately in order to be able to curette it and to remove the whole of its mucous lining, whether or not that lining is infected, since this is the condition essential to post-operative obliteration? For this reason I believe that the Caldwell-Luc operation in the case of the maxillary antrum and the Ogston-Luc in the case of the frontal sinus are, and will always remain the ideal operations when these suppurating cavities must be dealt with by the external route.

If these cavities when operated on by the external route become

filled up and for ever obliterated, not only do we obtain a cure of the sinusitis, but the patient is at the same time rid of the fear of possible recurrences. Whereas in cases where a maxillary or frontal sinusitis has been treated by the natural routes, and even when it has been cured in this way, one cannot but fear that the suppuration will recur whenever the patient is exposed to the influence of the same causes which had already induced the infection on one or more occasions (grippe, coryza, etc.).

In these cases the antrum of Highmore and the frontal sinus do not become obliterated, but retain the shape and configuration that they had during the time that they were suppurating. This fact can be verified in one way by transillumination, which generally demonstrates a return in these cases to the normal transparency, while in those operated on by the radical method the sinus, although cured, remains opaque, for it no longer exists. Again, if a stylet or trocar is inserted into a maxillary antrum which has been treated *per vias naturales* it enters the cavity easily while it is impossible to make the instrument pass into an antrum which has been treated and curetted through the external route.

The practical conclusion is easy to draw.

In this way the success which attends the external or "radical" methods can be explained.

At the same time, in the treatment of chronic frontal sinusitis it ought to be laid down as a principle that it is above all necessary to cleanse the ethmoidal cells through the natural routes. This evisceration of the ethmoid is a simple proceeding, devoid of danger, and it ought always to be the precursory stage of antrotomy by the external route. In order to carry out this method in the case of the frontal sinus, we make only such an opening as will enable us to inspect sufficiently the cavity together with whatever diverticula may be present. Through such an æsthetic opening a perfect and very thorough curettage of the whole of the sinus will be performed, the whole of the mucous lining being removed. I am accustomed, in my practice, to swab out the interior with a small tampon of wool fixed on a fine stylet and impregnated with a 10 per cent. solution of zinc chloride. The tampon should be sufficiently small to get to the bottom of all the recesses, and to detach completely all those portions of mucous membrane which are still adherent. A number of small curettes enables us to complete the purification of the frontal sinus.

This done, all that remains is to make a thorough exploration of the infundibulum by the side of the os unguis and behind

the nasal bones, where often enough diverticular calls are to be found, and then to enlarge the naso-frontal canal as far as the cavity of the nose.

The operation is completed by packing the sinus with a strip of iodoform or vioform (odourless) gauze ($\cdot 02$ to $\cdot 02\frac{1}{2}$ cent. wide), one end of which is introduced as far as the nasal fossa, through which it is removed three, four or five days later. The other end of the gauze is brought out at the internal angle of the cutaneous incision, between two suture points.

This method enables us to make sure that all the gauze has been removed; it gives us also the assurance of maintaining constant drainage during the whole period of cicatrisation—a matter of some five or six weeks at least. From what we have already seen there is no need after that time to concern ourselves with the formation of an artificial canal, for which, the sinus having ceased to exist, there can be no use.

I had already made these reflections, and laid the foundations of this paper,¹ when there appeared in the *Arch. f. Laryng.*, January, 1913 (Bd. xxvii, H. 1, p. 137, and more recently in the *Archiv. Internat. de Laryng.*, No. 2, March-April, 1913), an article by Dr. Ssamoylenko, which demonstrated experimentally the ideas I had formed on the post-operative obliteration of the maxillary and frontal sinuses. It was with the greatest pleasure that I read this original work, which was carried out in the clinic of Dr. Simanowki of St. Petersburg, and in which are published the results of experiments on cats (16) and dogs (8).

Under chloroform narcosis one of the sinuses was opened by that author, cleaned and curetted with scrupulous care, all the mucosa being removed with a sharp spoon, the neighbour sinus being left intact as a control. The animals were killed 14 days, 4 weeks, 1 month, 3 months, 5 months and $6\frac{1}{2}$ months respectively after the operation. He was thus able to determine that from the first days after the operation the periosteum augmented its volume, and then, in proportion to the time which elapsed from the operation, a cicatricial fibrous tissue appeared which, little by little, filled up the interior of the operated sinus cavity.

This new-formed tissue, examined by the microscope with varying degrees of magnification, showed the author that the sinus becomes obliterated by reproduction of new bone and by a sort of fibrous tissue. The obliteration was completed in about six months

¹ It was, as a matter of fact, in 1912, before the appearance of Ssamoylenko's paper, that I sent the title of this communication to London.—E. J. M.

or even sooner. From this the author concludes that, the structure of bone being identical in man and animals, obliteration of the frontal sinus may likewise occur in the same way that it is produced in animals. The author further demonstrated that the obliteration was not effected by a penetration of nasal mucous membrane—an impossible occurrence—but by a new formation of tissue, and he adds in one of his conclusions (No. 7) that in frontal sinus operations in man it is necessary to attend to the complete removal of the mucosa and to the cosmetic side of the operation, without which it would be necessary to have recourse to special measures in order to produce conditions favourable to the obliteration of the sinus.

This experimental demonstration of the suppression of operated sinuses supplies us with information of great practical value. It proves, in fact, that in order to cure a fungating or chronically infected antrum or frontal sinus complete curettage is necessary.

This, then, is, I repeat, a fact of capital importance, since it permits of the reduction to the minimum of the external opening, and so the carrying out of operations which need not be either deforming or mutilating. In this way we are able considerably to lessen the gravity of operative acts which many practitioners now hesitate to perform by reason of the unfortunate consequences which they have occasionally had to deplore.

What I have just said about frontal sinusitis, which certain operators cannot approach without misgivings, I repeat with regard to the maxillary antrum.

Indeed, if the whole of the mucous membrane of the antrum of Highmore is removed, we shall be astonished to find that several months later (five or six) it is impossible to penetrate the sinus, although at the time of operation it was found to be very wide and spacious. Here, again, the same process of repair is at work as in the frontal sinus: the cavity has disappeared, obliterated partly by a narrowing of the bony walls and partly by a new formation of fibrous tissue.

In this way also we may explain the slightness of deformity which even very wide openings in the canine fossa leave behind.

If, in the same way, we consider what happens to patients in whom the whole or part of the upper jaw has been removed, if we note the veritably extraordinary reparation which is produced in the osseous cavity, however large it may have been to start with, we shall not be surprised to find that Nature endeavours to obliterate cavities which have been denuded of their lining investment in operations which justly deserve the name of "radical cures."

This clinical and experimental demonstration of the post-operative obliteration of sinuses obviously nullifies those methods of treatment which consist in obliterating the frontal cavities by filling them up with substances more or less aseptic (Mosetig's or Morrhof's paste; various kinds of lead works, etc.)

I lay this fact, therefore, before my colleagues for their consideration; its practical importance cannot escape them.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE. OTOLOGICAL SECTION.

May 16, 1913.

DR. J. DUNDAS GRANT, *President, in the Chair.*

Abridged Report.

Unilateral Deformity of the Ear with Obliterated Meatus in a Child aged eight; Internal Ear Normal.—E. A. Peters, M.D.

Patient was born with a deformed ear. The helix and anti-helix are fused and small. The tragus and anti-tragus are diminished in size, while the cartilage is flat, small, with definite edges. There is no evidence of the presence of muscle, and the external auditory meatus is represented by a shallow pit. Tests (Weber) referred to right: Contact, no loss; watch, $\frac{8}{60}$; tuning-fork, 126 on mastoid, no loss.

Post-mortem Specimen of Unilateral Deformity of the Auricle, Meatus, and Middle Ear.—E. D. Davis, F.R.C.S.

The specimen was obtained from a child aged eight months, who died from enteritis and convulsions. No family history of deformities. The auricle is undeveloped, and no signs of meatus existed, but a blood-vessel occupied its position. The middle ear is filled with gelatinous embryonic tissue, in which fairly developed malleus and incus are embedded. The Eustachian tube is represented by a fissure, which is difficult to find. The auditory nerve and brain appeared to be normal.

Dr. DONELAN asked as to the mental history of Dr. Peters' case on the mother's side, because deformities of the ear were found in many cases where there had been insanity in the family, and the descent, he believed, was generally from mother to son.

Mr. MACLEOD YEARSLEY believed it had been said that in all cases like the present there was loss of bone-conduction. He had not found that to be so; many of the cases of deformity of ear which he had seen agreed with the present case.

Dr. PETERS had hoped to hear whether it was wise to do a modified mastoid operation, with skin-grafting, and whether such a procedure

would be likely to be followed by improved hearing. With regard to Mr. E. D. Davis's specimen, he had seen two or three cases with deformed external ears and apparent deafness in the first year of life, when, though the skiagrapher was uncertain as to the presence of an internal ear, partial hearing had developed in the second year. In this case either the partial hearing explained the afferent delay of a functioning ear, or it was possible that the tympanum was filled with embryonic rather than pathological tissue as in Mr. Davis's case. The infantile condition generally disappeared with development of hearing.

The PRESIDENT said the question which arose was whether some good could have been done by operation in Mr. Davis's case; the middle ear seemed as if it might have been a useful one, though there was very little room for getting at it by operation. The literature showed that there had been many operative failures in these cases; and apparently in only one, by Vali, of Buda Pesth, was great perseverance at last rewarded by success.

Epithelioma of the Helix. H. J. Davis, M.B.—Man, aged seventy. The ulcer was situated on the edge of the helix; it was first mistaken for



FIG. 1.—Epithelioma of helix. 'Ten weeks' growth.



FIG. 2.—Showing size of granulating surface fourteen days after the auricle was removed. A tube is worn in the meatus to obviate contraction.

a Hunterian sore, but no glands were involved and a Wassermann reaction was negative. Ten weeks before admission the patient "noticed a hard, painless lump on the edge of the ear." "It broke and developed into a sore." This was followed by neuralgia over the parietal region. The edges of the sore were everted and very hard. The ulcer was 1 in. long by $\frac{1}{2}$ in. wide. A piece of the edge of the ulcer was reported as epithelioma. The auricle was then amputated. The area of attachment of the pinna to the side of the head is larger than one would suppose, as the accompanying photograph indicates. No grafting was necessary as the raw surface epithelialised with astonishing rapidity. A tube has

been worn in the meatus to obviate contracture. The patient is quite well, and has gained weight since the removal of the pinna.

Dr. W. MILLIGAN suggested that an artificial ear should be procured for the patient. It could be obtained from Mr. Brooke, of Halifax, Yorks. He asked whether there had been a history of injury in the case as an exciting cause. One otological authority said that the upper third of the margin of the helix was the usual situation for the development of epithelioma on account of the sparse circulation.

Mr. SYDNEY SCOTT asked whether Dr. Davis proposed to remove the cervical and pre-auricular glands, or whether he intended to wait until their enlargement indicated this necessity. He suggested anticipating further trouble by removal of those glands now.

Dr. DAN MCKENZIE showed some years ago a case of epithelioma of the pinna in an old man, aged seventy-six. There the disease began at the back of the pinna, not at the edge. He removed the auricle, as Dr. Davis had done in this case, and with, at first, a pleasing result. But before the lapse of many months there was recurrence of the disease in the scar, and the man died of it. In the discussion on the case someone suggested that it might have been advisable partially to close the raw area left after the removal of the pinna, by splitting the lobule and turning it up as a flap.

The PRESIDENT had shown a similar case in which the epithelioma was in the upper third. In that case he removed a wedge, fairly wide of the epithelioma, and the patient lived many years after the operation without recurrence and without enlargement of glands. He asked whether Mr. Scott had invariably found involvement of glands after complete removal of the pinna. Possibly the wedge operation was the preferable one.

Mr. SYME had had a case in which there was epithelioma of the upper part of the auricle. He did a wedge operation, but, unfortunately, it did not include removal of glands, which were not then palpable. But there was a recurrence in the glands with very rapid enlargement. He had never seen such an acute recurrence. The patient was a man aged ninety.

Mr. COLLEDGE had seen a case of malignant disease of one ear on which operation was done by the late Mr. Clinton Dent in 1905—namely, removal of a wedge only. The patient returned to hospital last year (1912) with a similar condition in the other ear. There was no sign of recurrence on the side previously operated upon, although the glands had not been touched.

Dr. H. J. DAVIS said there was no history of injury in the case. Mr. Scott's suggestion was in his mind when he operated, but as the glands were not enlarged he decided to do nothing further. At the present time there was no indication of any glandular involvement. The case was a very early one.

Occlusion of the Meatus and Middle Ear by Bone following Operation for Acute Mastoiditis and Extradural Abscess.—H. J. Davis, M.B.—In October, 1912, the patient, a boy, aged ten, was operated on twice for extensive mastoid disease—a large abscess in the posterior fossa was dealt with at the same time. A radical mastoid was completed at the second operation, when the post-aural wound was closed by a plastic operation. The large bone cavity was now not only completely filled in, but the process of new bone formation had extended and entirely occluded the meatus; presumably the mastoid, middle ear

and meatus were converted into a mass of solid bone. The usual difficulty experienced after extensive bone operations in this region is to heal or obliterate the cavity left after operation, but this has occurred in this case by an over-extension of the normal process of bone repair.

Dr. W. MILLIGAN asked whether it was not really a question of sepsis, in which a hyperostosis was produced as the result of a still-continuing septic process. He believed the ear was still discharging, and he did not think the disease had disappeared.

Dr. H. J. DAVIS replied that the ear had been dry for six months until three days ago, when it recommenced discharging through the minutest pin-point hole in the meatus.

Persistent Paroxysmal Cough apparently due to Irritation of Chorda Tympani Nerve by a Spicule of Steel which penetrated the Tympanum.—James Donelan, M.B.—Man, aged forty-five, seen by Dr. Donelan six years. Some days after visiting some engineering works he was attacked by a violent fit of coughing with feeling of discomfort along the left side of the tongue. This symptom constantly recurred on apparently no provocation from any ascertainable cause for two years. His larynx, except for a general hyperæmia, probably due to the cough, was normal. Nothing could be found in the cervical or thoracic regions to account for it. The right ear, meatus and tympanum were normal. So were the left, except for a tiny black spot with a reddish areola round it, situated just behind the malleus at exactly the spot where the chorda tympani nerve crosses it. Cocaine was applied, and a small spicule of steel about 3 mm. long was extracted. The patient had a most violent fit of coughing then, but according to the last report he has had no further return of his trouble.

Congenital Prominent Auricles treated by Operation.—J. Dundas Grant, M.D., and Dan McKenzie, M.D.—The patient is a lad, aged ten. Three years ago his mother brought him to hospital on account of his "ugly ears," the whole auricular cartilage standing out from the head like the ears of a bat. In the case of the left ear the skin of the posterior surfaces of the auricle and of the adjoining portion of the mastoid region was removed, and in addition a narrow segment of the auricular cartilage involving its whole thickness and traversing the anti-helix was excised in order to hinder the resiliency of the cartilage from restoring the prominence of the auricle after operation. In the right ear the operator contented himself with rawing the skin surface. The cartilage on this side was not excised or cut through. The result on both sides proved satisfactory, but the case shows the advantage of removing a slip of cartilage, as the left ear is now the less prominent of the two.

The PRESIDENT said the question was whether it was advisable, in all cases of outstanding ears, to remove a portion of the cartilage at the same time. The side from which the cartilage was removed was a little closer, but the difference was not very great. It seemed that the right principle was to remove the cartilage in the worst cases, and in the slighter ones to try to do without that procedure.

Mr. WESTMACOTT had had several cases in which he had carried the operation wound further back. He always made the incision as far outwards as the ridge behind the edge of the pinna, removed the skin from the cartilage and also from the scalp for a similar area, and then laid the ear back against the head, suturing the edges. He had found

this more successful in preventing recurrence of deformity. There was a sufficient sulcus left to keep spectacles in position if they need be worn.

Dr H. J. DAVIS knew of an instance in a boy who was operated upon when he was at a public school. One operation consisted in removing part of the helix, and on the other ear a posterior operation was performed; hence the asymmetry was as noticeable as before.



I.

II.

Prominent auricles treated by operation. On the left side a portion of the auricular cartilage was removed. The second photograph was taken three years after operation.

Thrombo-phlebitis of the Mastoid Emissary Vein.—**Dan McKenzie, M.D.**—A boy, aged eight, was operated on for acute mastoiditis on March 18, 1913. The mastoid cells were found to extend further back than could be comfortably reached through the post-aural incision, and so the usual incision running horizontally backwards from the middle of the post-aural incision was made. In so doing a large vessel was cut and spouted very freely. In the absence of antiseptic wax (soap or paraffin might have taken its place!) the bleeding was after a time arrested by the pressure of a gauze tampon plugged into what turned out to be the foramen of a capacious mastoid emissary vein. The operation was then concluded in the usual way. Three days after operation the temperature rose to 102.2° F., falling to 99° in the evening. Next day a similar rise was recorded, and on March 22, suspecting the onset of thrombosis of the lateral sinus, I reopened the wound and exposed the mastoid emissary vein lying in a bony canal about $\frac{1}{2}$ in. in length. The vein was turgid, sausage-looking, and very large. On being slit up it was found to contain a blood-clot about $\frac{1}{4}$ in. in length; and the vessel itself was seen to be about as wide as a large goose-quill. After the clot was shelled out of the vein, regurgitant bleeding took place from the lateral sinus, and an extension of the incision into the

walls of the sinus showed the latter vessel to be healthy. Thirty-six hours after the operation the temperature fell to normal. Recovery.

Dr. W. MILLIGAN said that if one had not got antiseptic wax at hand, a very good substitute was to take a wooden match, sterilise it, whittle it down and insert it into the bone at the bleeding point, or the point of a Krause's hook might be inserted into the bleeding point, and so twisted about as to cause the blood-vessel to contract.

Congenital Syphilitic Deafness treated by Neo-salvarsan.

John F. O'Malley, F.R.C.S.—E. W——, aged ten, came under my care on December 16, 1912, with a history of one year's deafness on both sides. The tympanic membranes were retracted, Rinne negative, and this, with the history, pointed to chronic Eustachian catarrh as the cause of deafness; but the combination of the more complete function tests led to a Wassermann reaction being made, although the patient had none of the commoner stigmata of congenital specific disease.

The function tests before and after treatment showed a striking improvement in hearing (whisper, nine feet before treatment; twenty-one feet after). Wassermann positive; 0.3 gm. neo-salvarsan intravenously at monthly intervals.

The PRESIDENT said the bone-conduction tests seemed to be conclusive, and the Wassermann reaction confirmed the history, but the physiognomy did not give support to the idea of syphilis, so it was important the Wassermann test was made.

Dr. W. MILLIGAN did not feel certain that it was a syphilitic ear case; there was ambiguity about some of the tests. It might have been a case of pan-otitis following influenza in a syphilitic subject. There was clinical evidence of there having been a recent middle-ear lesion with tubal obstruction.

Mr. E. D. DAVIS had used neo-salvarsan in several cases, though in only one ear case, and he used it because it was so easily dissolved in distilled water. The results seemed just as good as with salvarsan.

Mr. WHALE did not agree with Mr. Edward Davis's remark; he had several times given from nine to fifteen doses of neo-salvarsan before the Wassermann became negative, and that was a serious drawback in treatment.

Mr. SYDNEY SCOTT said it was important to be sure whether this was really so-called congenital syphilitic deafness. The patient probably had had syphilis, as the Wassermann was positive and he was deaf, but it did not follow that the deafness was due to the syphilis. The tests pointed to the existence of Eustachian catarrh, and he strongly deprecated the conclusion that it was definitely a case of syphilitic deafness cured by neo-salvarsan.

The PRESIDENT said it would be inadvisable to use salvarsan in any case unless one was sure it was syphilitic. The drug had not been entirely acquitted of causing arsenical disturbances in the nervous system.

Mr. O'MALLEY said the patient's deafness was a year old, and she had to be placed on the front seat in her class. It was that fact, coupled with marked shortening of bone-conduction, which led him to have the Wassermann done. After three doses the hearing strikingly improved.

Phlebitis without Thrombosis of the Sigmoid Sinus.—**Arthur Cheatele, F.R.C.S.**—A child, aged two, was admitted to hospital on March 11, 1913, acutely ill with a mastoid abscess and a temperature of

103° F. At the operation on the same day it was found that the sigmoid sinus had been exposed by the disease. The sinus wall did not appear to be granulating, but felt and looked quite smooth, and appeared firm. The next afternoon, as the child was not relieved, and the temperature in the morning was 104.2° F. (without a rigor), the sinus was very thoroughly exposed; it appeared pale and "lumpy," and felt firm. On incising it no blood escaped. The jugular vein, which was collapsed and not thrombosed down to the combined facial and lingual, was then tied and divided. The sinus being opened, it was found that the firm feeling was due to great thickening of the wall, and that the lumen was exceedingly small and contained a little fluid blood without any thrombus. No flow of blood could be obtained even when a curette was passed nearly up to the torcular. The child was rather ill for four days, but after that recovery was quick and uneventful. The condition appears to have been one of inflammation of the sinus wall, and it is a question whether free exposure alone would not have sufficed.

Acute Suppuration of the Middle Ear with Postero-superior Bulging, treated by Means of Hartmann's Punch Forceps; Rapid Subsidence.—J. Dundas Grant, M.D.—L. G.— had an attack of influenza six weeks ago, followed by acute inflammation of the right middle ear. There was a rounded swelling filling the fundus, formed no doubt by a bulging of the postero-superior part of the membrane, bathed in pus; after clearance of the moisture and the application of cocaine, a narrow crescent of normal tympanic membrane could be seen on pushing up the bulging portion of the membrane. Puncturing with a paracentesis needle would not have been sufficient for drainage, as the swelling was not a simple sac of thin membrane, but was apparently chiefly inflammatory tissue; a more useful opening was, therefore, made by punching out a small piece with Hartmann's small aural punch forceps. The perforation healed, and the hearing returned completely in about three weeks after this was done. There is now a slight depression behind the handle of the malleus. (This use of Hartmann's forceps was advocated at the Boston International Otological Congress by Dr. Lewis.)

Narrowing after Radical Mastoid Operation treated by means of Hartmann's Punch Forceps.—J. Dundas Grant, M.D.—The patient, a girl, aged twelve, had had a radical mastoid operation performed, but the ear did not get well, and she came under the exhibitor's care for other reasons. He found an oozing from the ear, and at the site of the operation a diaphragm over the deeper part of the operation cavity with a very small opening in it, scarcely larger than a pin-hole. One disadvantage of the minuteness of the opening was that the antiseptic drops could not obtain entrance. He cocainised the ear and introduced a probe covered with cotton-wool, and dilated the hole sufficiently to allow of the introduction of Hartmann's punch forceps (with the points turning upwards). With that he cut upwards and punched out a portion of the diaphragm; the opening was now about 4 mm. across, and on looking through it granulations could be seen; some of these he had removed with the punch forceps and a cutting ring, and in addition he had on several occasions injected a few drops of a 1 per cent. solution of chloride of zinc up the Eustachian tube. The ear was now doing well, and re-opening of the mastoid cavity had been avoided.

Chronic Attic Suppuration treated by Operation with Retention of Ossicles and Remains of Membrane.—J. Dundas Grant

M.D.—Female, aged twenty-three, had had discharge from her left ear for about ten years. The discharge issued from the attic, there being no perforation in the lower part of the membrane and no perforation sound on inflation; the hearing was very good (better than it would be after the complete mastoid operation). The exhibitor, therefore, performed the mastoid operation, retaining the ossicles and as much of the tympanic membrane as remained, and taking away the overhanging bone over the cavity from which the pus came. The diseased cavity was, therefore, shut off from the Eustachian tube and the naso-pharynx, and healing took place extremely quickly. If the ossicles and membrane had been removed and the cavity of disease had been left in communication with the pharynx, then the slightest cold in the naso-pharynx would have extended up into the tympanum and delayed the healing, from the continuous slight reinfection. The discharge has stopped for some weeks, and there is now an opening into the aditus and antrum, the edges of which are still stained red by the scarlet-red ointment. The attic was removed ten weeks ago.

Chronic Suppuration of the Middle Ear, rebellious to Trans-meatal Treatment until supplemented by Tubal Injections of Chloride of Zinc.—**J. Dundas Grant, M.D.**—Female, aged twenty, first seen on February 11, 1913, on account of discharge from her right ear, which had lasted on and off since childhood, and had been worse during the last eighteen months; the lower portion of the tympanic membrane was absent. The condition failed to respond to simple treatment, such as cleansing and the instillation of spirit drops through the meatus, and the question arose as to whether a radical mastoid operation would be necessary. However, the exhibitor decided to continue with the spirit drops a little longer, and in addition, at first twice a week, and then once, he injected a few drops of a 1 per cent. solution of chloride of zinc up the Eustachian tube through the Eustachian catheter; a little cocaine was first sprayed up the Eustachian catheter, then the chloride of zinc was blown in, and finally a few drops of paroline were injected in order to drive the chloride of zinc right up into the tympanum. Improvement ensued, and at present there is no sign of pus.

Temporo-sphenoidal Abscess following Mastoid Disease and Aural Polypus.—**H. J. Davis, M.B.**—The patient, a girl, aged fourteen, was admitted to the hospital six weeks ago with vomiting, vertigo, and facial paralysis. A large aural polypus was protruding from the meatus. There had been otorrhœa on and off for four years. There was no indication of any mastoid tenderness. The polypus was removed and the mastoid antrum opened; the roof of the antrum was eroded and an extradural abscess was evacuated. The brain protruded into the wound, but did not pulsate; a knife was therefore passed into the temporo-sphenoidal lobe, and three drachms of pus evacuated. The dura mater was snipped away over the brain abscess area, and the wound left open. Uninterrupted recovery.

A Double Skin-flap in the Radical Mastoid Operation.—**P. Watson-Williams, M.D.**—First incision extends from just above the highest point of attachment of the pinna, curving outwards and backwards well within the margin of the hairy scalp, curving forwards below to the mastoid tip. The skin and soft tissues are dissected forwards to the margin of the bony meatus, leaving the periosteum. The posterior meatal

cartilage (with skin) is divided by a longitudinal incision extending into the meatus, and the auricle and skin-flap are held forward together, while with a narrow knife two incisions are made extending from the tympanic ring so as to divide the posterior cartilaginous and membranous meatus above and below. The higher incision is extended upwards, and the lower one horizontally backwards on the mastoid eminence. The periosteum is raised from the bone together with the attached posterior meatal wall, and turned backwards and upwards till the bone operation is completed, when it is replaced so as to form a periosteal lining to the upper and back part of the bone cavity. The lower flap of periosteum is also replaced and the conchal flap is then formed (Milligan's flap), and is secured by a catgut ligature. The meatal skin-flap then lines, with the periosteum, the upper and back part of the bone cavity, while the conchal skin-flap lines the floor and inner aspect of the auricle where it overlies the bone cavity. The inner tympanic wall in cases where useful hearing exists can usually be retained intact, only the orifice of the Eustachian tube and hypotympanum being eurented. The infected tympanic wall mucosa recovers, much as the mucosa lining a maxillary antrum in antral suppuration, and in many favourable cases the patient may thus be left with good hearing power.

By the double skin-flap here described one combines the advantages of Hugh Jones's flap with that described by the author as a periosteal lining flap, and appeared to promote rapid epithelialisation of the mastoid cavity in the author's experience of the few cases in which the double skin-flap was used.

Post-mortem Specimen of a Radical Mastoid Operation performed Six Months before Death.—E. D. Davis, F.R.C.S.—The specimen showed tuberculous disease of the mastoid operation area, including the dura mater which had been exposed at the operation. The patient died of pulmonary tuberculosis.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

March 7, 1913.

MR. HERBERT TILLEY, *President, in the Chair.*

Larynx removed (Post-mortem) from a Man who had worn a Tracheotomy Tube for eighteen years.—Herbert Tilley, F.R.C.S.—Male, aged fifty-eight, consulted me eighteen years ago for difficulty in breathing, of an urgent nature, especially on slight exertion. Laryngoscopic examination showed the vocal cords in the adducted position, and some fulness of the arytenoid regions. No lesion was discovered in the chest nor in the central nervous system. Tracheotomy was performed under local anaesthesia, and for eighteen years the patient did his work satisfactorily. No one has been able to throw any light on the nature of the original lesion in the larynx. Last month he died of "blood poisoning," and I was only able to secure the larynx. The larynx shows maldevelopment of the cricoid and left arytenoid: the latter is only about half the usual size. The posterior lamina of the cricoid is very narrow transversely.

and has a fissure in the mid-line, which is filled up with membrane continuous with that of the trachea. From the narrowing of the posterior lamina there results a falling together of the alæ of the thyroid, and the angle they form anteriorly is very acute. The right half of the cricoid is less developed than the left; as a consequence the right arytenoid is placed more forward than the left, and the epiglottis tilts downwards and to the right. The arytenoid cartilages are very vertical, and their mesial surfaces in contact, but the narrowing of the rima appears to depend more on the falling together of the alæ of the thyroid. These conditions of the larynx are very rare, and he doubted whether there was a record of anything like it in the literature of laryngology.

Sir FELIX SEMON had never seen anything like the present case, and doubted whether an exactly similar one had ever been described. Twenty years ago, however, he showed at the Clinical Society of London a curious case of congenital malformation of the larynx and trachea, with a diverticulum of the œsophagus, occurring in a young woman.¹ In that case the thyroid cartilage was more prominent than usual in women, and it was found, on palpating the larynx, that the two halves of the thyroid were not united in front by cartilaginous union, but merely by a firm ligamentous connection. The record stated that the finger-tip could be easily introduced into the fissure resulting, and the right half of the thyroid distinctly overlapped the left. The laryngological examination showed a striking picture, the right half being higher than the left, and a remarkable feature was that one could look right down into the right ventricle of Morgagni, and that the right vocal cord was visible along its entire breadth.

The PRESIDENT replied that he did not know how to explain the relationship between the symptoms and the laryngeal condition. It was difficult to understand how a man should have lived for the time this patient had—he came under notice when aged forty—without trouble, and then suddenly develop symptoms. The maldevelopment of the larynx was probably congenital, and some inflammatory conditions arose leading to the necessity for tracheotomy. There was no history of traumatism.

Killian's Apparatus for Suspension Laryngoscopy.—**Walter Howarth, F.R.C.S.**—By the use of this apparatus an admirable view is obtained of the larynx and of the deep pharynx. It possesses several points of advantage over the ordinary direct method, the principal ones being that the field is considerably larger and that the surgeon has both hands free.

Dr. BROWN KELLY said he had used the apparatus for papilloma, lupus, and tuberculosis, and to obtain a good view of the post-cricoid region. It not only gave a very extensive view, but also allowed one to get nearer the parts. The chief consideration was that it enabled the most delicate operations in the larynx to be carried out by those who had never used the laryngeal mirror.

Dr. WILLIAM HILL had tried Killian's suspension apparatus in a case where he wished to remove a growth near the anterior commissure. Unfortunately it was not possible to get a view of the anterior third of the glottic region. Such an experience naturally did not impress him very favourably with the scope of this new method. This new apparatus gave a splendid field of view for operations in the arytenoid region and pyriform fossæ, but it seemed to have a limited field of usefulness. He

¹ See *Trans. Clin. Soc., Lond.*, xxv.

believed that improvements in this apparatus would be made in the near future so as to increase its field of usefulness, more especially in bringing well into view the anterior commissure in all cases.

Mr. EDWARD DAVIS believed Mr. Howarth would show an apparatus in which there was a method of pressing the larynx backwards into the pharynx, enabling a better view to be obtained of the anterior portion of the cords. So far he had not obtained a good view of the anterior commissure.

Mr. LAYTON said the apparatus might be made to fit on the left side of the table, as at present the upright was in the way if any external operative treatment became necessary.

Sir FELIX SEMON said Killian looked at it from the point of view of the importance of being able to use *both* hands, and the operator was not encumbered, as in the case of the direct or the indirect method, by having his left hand engaged in holding either the mirror or the handle of the tube during the whole of the contemplated operation.

Mr. WAGGETT found the instrument valuable in the examination of the hypopharynx and pyriform fossæ.

Mr. HOWARTH said that the instrument seemed to him to have some mechanical defects. The chief advantage of the apparatus was the wide and free view to be obtained of the posterior and lateral parts of the larynx, and of the deeper parts of the pharynx.

Piece of Broken Tracheotomy Tube removed from the Right Bronchus.—Walter Howarth, F.R.C.S.—The patient came up to hospital and asked for a new tracheotomy tube. It was noticed that his old one was broken, and as he had some cough and blood-stained expectoration an X-ray photograph was taken. The specimen was removed under cocaine anæsthesia.

Papilloma of Soft Palate.—Walter Howarth, F.R.C.S.—This case was shown at the January meeting after a large fibroma had been removed from the soft palate. The present condition had arisen since that date. It was interesting to note that a small papilloma had been removed from the base of the uvula last July.

Mr. BARWELL doubted the diagnosis of papilloma, though from one inspection he would not be too dogmatic. The growth seemed to be very massive and to be infiltrating the tissues, and he thought that it would prove to be malignant.

Dr. LOGAN TURNER said he also considered the condition might be malignant, though the question of tuberculosis entered his mind. It was, however, rather rapid for tuberculous disease.

Dr. BROWN KELLY also doubted whether it was papilloma. Last session Mr. Lack showed a case of so-called papilloma of the palate in which there was a similar doubt. Histologically it proved to be papilloma, although clinically it seemed to be malignant.

Mr. HOWARTH said that the diagnosis was made from the clinical appearance, he had only seen the patient that day and had not had time to have a microscopic examination made.

Laryngectomy subsequent to Tracheotomy for Epithelioma of the Larynx.—Dan McKenzie, M.D.—The patient is a male, aged fifty-two. Laryngectomy was performed seven weeks ago. The interest in the case from the operative point of view lies in the fact that tracheotomy had been performed a fortnight before the larynx was removed.

Thus the typical operation with the suturing of the whole tracheal margin to the skin could not be readily adopted. However, in order to avoid the dangers of an open trachea in the lower part of the neck wound, the upper end of the trachea was closed by catgut sutures, the lower margins of the lateral skin-flaps were sutured to the posterior margin of the trachea, and the whole, or nearly the whole, of the lower transverse incision was left open and packed lightly with gauze. The result was satisfactory. By the time (ten days after operation) the tracheal sutures had given way and the upper end of the trachea began to gape, the upper part of the wound had become isolated from the lower. By these means the pharyngeal discharges were prevented from reaching the trachea during the whole course of the convalescence. The wounds healed rapidly, and this I ascribe to the facts that all the teeth were removed (the patient was the subject of pyorrhœa), and that the feeding tube was kept in the œsophagus for sixteen days. Respiration is now effected through the upper end of the trachea. The original tracheotomy wound has closed, but the patient still wears a rubber tube in the upper end of the trachea. The specimen of the larynx removed from the above case shows the growth extending vertically from the middle of the left ventricular band to the level of the cricoid cartilage, and involving the left side of the larynx chiefly. Diagnosis of epithelioma before operation by microscopic examination (Dr. Wyatt Wingrave).

Sir STCLAIRE THOMSON said that from examination of the specimen it was clear that laryngo-fissure would not have got beyond the disease without scooping out the soft parts on both sides to such an extent as to produce practical stenosis. It was a suitable case for laryngectomy—too far advanced for laryngo-fissure, and not too far extensive for excision of the larynx. But Dr. McKenzie, in removing it, did not split the larynx first. No harm had come from that in this particular case, but it would be well to split it first and look inside, for he had known more than one case which, after removal, turned out to be syphilitic and not malignant. Another reason was that in a case he had recently, he fully intended to do laryngectomy, but he afterwards congratulated himself on having split the larynx, because although at first it looked a most suitable case in regard to the larynx proper, he found the disease had spread below the cricoid on to the first two rings of the trachea, and invaded the partition between the trachea and the œsophagus, and so the case was useless for laryngectomy. He therefore closed it up, and simply left in a tracheotomy tube.

Dr. D. R. PATERSON agreed with Sir StClair Thomson's remarks about splitting the larynx. He had a similar case in which he found that the back wall over the cricoid was very considerably affected. He finished the operation there, and put in a tracheotomy tube, and the patient was still alive and had very fair comfort. Another point was that in those cases calling for laryngectomy in which the patient had a short neck, the plan adopted by Dr. McKenzie of putting in a tracheotomy tube for ten days was admirable, because it fixed the trachea to the skin wound much better. There was a great tendency for the trachea in short-necked people to retract.

Dr. BRONNER some years ago saw a case in which a patient had had tracheotomy performed, and it was intended to remove the larynx. He saw a big growth which he regarded as carcinoma entering the larynx; the growth, however, was growing from the posterior wall of the pharynx, and had covered the glottis, so that the patient could not breathe properly. The larynx, however, was found to be normal.

Dr. DAN McKENZIE, in reply, said he was much interested in the remarks made in regard to splitting the larynx, but while it was true that splitting the larynx enabled one to see the extent of the growth, it was possible to imagine that one might be deterred, in certain cases, from proceeding to laryngectomy after splitting the larynx by a fear that the growth had extended beyond a point from which it could well be removed by laryngectomy. As time went on bolder measures were attaining success, and he thought that if one adopted a radical attitude in those cases, that was the line along which progress would be made. The question of syphilis had been settled before operation.

Cystic Distension of the Lachrymal Sac; Operation on Nasal Duct in the Nose (West's Operation).—Dan McKenzie, M.D.—The patient is a woman, aged thirty-two. She has been suffering from ethmoiditis for some years. Four months ago, after the removal of polypi from the left side of the nose, she noticed a swelling at the inner canthus of the left eye. The swelling corresponded in situation with the lachrymal sac. It was tense and fluctuating, and could be emptied into the nose by steadily pressing upon it. On November 28, 1912, West's operation was performed. A flap of mucous membrane, with the base posteriorly, was raised from the lateral wall of the nose at a level between and in front of the anterior ends of the middle and inferior turbinates. With a gouge the naso-lachrymal bony canal was broken into and the membranous nasal duct exposed. The nasal duct was then opened up as high as the lachrymal sac. Lachrymal probes, which formerly met with obstruction in their route towards the inferior meatus, now passed freely into the middle meatus. So far there has been no return of the swelling.

Dr. D. R. PATERSON had had difficulty in keeping the opening patent, as in nearly all artificial openings there is a tendency to stenosis later. What had deterred him, however, latterly, from proceeding with this operation in some cases was that he saw a case reported where the person had some difficulty in blowing the nose, for when he attempted it, he blew air through the lachrymal sac and duct, and he had to hold pressure on the corner of his eye to prevent it. In one case where there was a good deal of disease round the sac and in the ethmoid cells he had removed the sac; and in that and in another case the result was excellent. Beyond a little watering when exposed to a cold wind there was practically no discomfort resulting. A colleague had done Toti's operation of establishing a communication with the interior of the nose by stitching the mucous membrane of the sac to the nasal mucosa six times, three of which had been successful, but there also the difficulty was to keep the opening patent.

Extensive Granuloma of the Larynx in a probable Case of Early Phthisis.—T. Jefferson Faulder, F.R.C.S.—Male, aged twenty-one, was well until the spring, 1912, when he had a "cold" and loss of voice; recovered more or less completely; again had a "cold" in December followed by loss of voice. January, 1913: Voice reduced to a hoarse whisper; pharynx, larynx and trachea intensely inflamed; in the inter-arytenoid space a tumour, like a papillomatous growth, preventing adduction of the cords; no dysphagia; no sputum or night-sweats; no loss of weight or appetite. February 2: Inflammation has subsided; voice still lost; cords cannot be adducted posteriorly. There are

practically no physical signs in the chest, but the physician's opinion is that the case is one of very early phthisis.

Mr. BARWELL said the patient had an inter-arytenoid swelling, with some infiltration of the vocal cords, such as he had always associated with tuberculous laryngitis. The treatment depended on the patient's general condition of health and the progress of his lung condition. The patient should be kept under careful observation for two or three weeks, and the temperature, weight, etc., carefully noted before the question of operation was entertained. If the general condition of the patient should be satisfactory, the outgrowth in the inter-arytenoid space could be removed.

A Cartilage of the Septum Nasi removed by Operation and showing a Circular Defect.—T. Jefferson Faulder, F.R.C.S.—The mucous membrane on both sides of the septum was intact, but that on the wide side showed slight atrophy. The patient was a female, aged twenty-three, a draper's assistant. The septum has healed satisfactorily. The case illustrated one of the difficulties in doing submucous resection. He did not know what was the explanation of the aperture in the cartilage. His instrument slipped through to the other side, after which he could see the perforation and avoid it. In a small way this case reminded him of one which he had reported, where a partial resection had been done previously with an incision too far back. He began his operation not knowing that part of the septum had been removed before, and everything went well until he arrived at the gap in the cartilage. It was possible to separate the flaps again after a period of five years.

Dr. DAN MCKENZIE had shown before the Section two specimens of a fenestrated cartilage removed by resection. The genesis was interesting. He believed the holes in the cartilage were due to deposits on both sides of the septal mucous membrane of mucus, which, drying, produced pressure atrophy of the underlying cartilage. He suggested that perforation of the septum was due to the presence of one of these fenestræ in the cartilage prior to the perforation of the membrane. He had been looking for many years in vain for the typical classical case of acute perforating ulcer of the septum. This pressure atrophy would not affect the bone, only the cartilage, since the former contained an intra-osseous blood supply, while the latter was nourished solely from its surface.

Dr. W. HILL said it was not uncommon in children to see a hæmatoma which had suppurated, and he had never incised such an one without finding a hole in the cartilage. A former suppurating hæmatoma was probably the explanation in some cases of a perforation of the cartilage, but with intact mucosa.

Laryngeal Tubercle apparently aggravated by Tuberculin.—

E. D. Davis, F.R.C.S.—The specimen was obtained from a male patient, aged thirty-eight, admitted to Hospital with advanced laryngeal tuberculosis, and with chronic pulmonary tuberculosis of the apex and pleura of the right lung. Death was caused by diffuse tuberculosis, with cavity formation of the right lung, and recent miliary tuberculosis of the left lung. Patient was first seen in August, 1912. He was treated by cauterization, puncture, rest, insufflation, etc., with little relief or benefit. October: Epiglottis amputated with punch forceps (specimen shown). Patient was considerably relieved (?), wound healed within a week, and did not cause any pain or dysphagia. Ulceration of the base of the tongue and

left ventricular band, and arytaenoid curetted with Heryng's currettes, both by the indirect method and by suspension laryngoscopy. The ulceration of the base of the tongue healed, and the ventricular band improved. At this point the patient appeared to be gaining ground, and tuberculin (B.E. $\frac{1}{50000}$ mgrm.) injections were given with marked reaction, fresh sloughy ulceration, and definite retrogression of the patient. The patient suffered considerable pain, which was only slightly relieved by cauterly puncture, curetting, and other remedies, but was almost completely abolished by the injection of eucaine and alcohol into the left internal laryngeal nerve and subsequently into the right nerve. After this injection he gained $3\frac{1}{2}$ lb. in one week, and improved rapidly. At the end of January, when the larynx was doing well, an exacerbation of the lung condition occurred, from which he died on February 17. The vigorous treatment of the larynx relieved the pain and discomfort, and prolonged life.

Amputation of the Epiglottis for Tuberculous Ulceration.—E. D. Davis, F.R.C.S.—A male patient, with a long history of laryngeal and pulmonary tuberculosis. The epiglottis ulceration had been cauterised and curetted with no improvement. Amputation with punch forceps on February 5, 1913. Rapid healing of wound. Patient is receiving tuberculin B.E. 1 mgr.

The PRESIDENT said he supposed all members had amputated the epiglottis, and probably with great relief, when it was done for extreme pain on swallowing. But few were able to find out what happened to the cases afterwards, for they drifted away, and perhaps had a recurrence of symptoms. It was valuable to hear the later history of these cases, for they should make the operator careful in promising too much from the point of view of cure.

Mr. BARWELL said he had amputated a number of epiglottides at the Mount Vernon Hospital, but they nearly all went to the bad eventually, because there was seldom extensive tuberculous involvement of the epiglottis until advanced tubercle was manifest elsewhere. It was only occasionally that one met with epiglottic disease in which the rest of the larynx was more or less healthy. He had had only two cases in which the larynx became completely healed after amputation of the epiglottis. One died eighteen months later of sudden hæmoptysis, but the larynx had remained well during that time. The other he operated upon in private twelve months ago, and the larynx had healed and remained well. The operation was usually performed simply for the relief of dysphagia, for which purpose it was very successful.

Laryngeal Infiltration for Diagnosis.—Harold Barwell, F.R.C.S.—Chelsea pensioner, aged eighty. Hoarseness and slight dysphagia for three months; a little dyspnoea during the last two weeks. Enlarged movable gland on the right side of the neck and a small aneurysm at the left carotid bifurcation. The infiltration affects the anterior parts of both ventricular bands and appears smooth, dusky, and somewhat oedematous. The right side is the more affected and its movements are more restricted than those of the left. The cords appear to be normal. The sputum shows no tubercle bacilli, but large numbers of what appear to be pneumococci.

The PRESIDENT said one vocal cord was moving very freely, and there was no definite sign of ulceration. He thought chronic tubercle was more likely than malignancy.

Suppurating Mucocoele of Frontal Sinus in a Boy, aged twelve.
—**Harold Barwell, F.R.C.S.**—Note on February 21. Severe "cold" two months ago, with profuse discharge from the left nostril. Swelling on forehead noticed for one month; eight days ago great swelling of eyelids, subsiding under hot fomentations. No pain. Hard bony swelling over site of anterior wall of left frontal sinus, and in upper, inner angle of left orbit. Streak of pus high up in left hiatus semilunaris, reappearing rapidly after mopping; no pus after stooping.

Dr. DAN McKENZIE did not believe that mucocoele of the frontal sinus meant that the duct of the sinus was blocked and mucus accumulated in it. He considered the condition to be due to the formation of a mucous cyst inside the sinus.

The PRESIDENT agreed with Dr. McKenzie's view as to the nature of some of the mucocoeles. With regard to the size of the frontal sinus in children, he remembered a boy, aged eight, whom he saw with acute frontal sinus suppuration complicating scarlet fever. That boy had a sinus as large as a horse-bean.

Mr. EDWARD DAVIS had made a *post-mortem* examination of a child, aged four, who died of orbital cellulitis following scarlet fever, and the question was whether the frontal sinus was responsible. The frontal and sphenoidal sinuses were occupied by vascular cancellous bone, but there were no cavities. The antra were well developed, but without ostia, and the ethmoidal cells were very small.

Dr. BRONNER had seen two cases of frontal sinus disease after scarlet fever, and those children had large sinuses. He asked whether members had tried injections of tincture of iodine in frontal sinus disease. He had done so in two cases, and the discharge stopped after three injections.

Mr. BARWELL agreed that the mucocoele was a dilatation cyst of a mucous gland in the lining. In this case he could see a stream of pus coming into the nose; evidently the ostium was not blocked. He had had to operate on the boy since sending the notes of the case; the bone was considerably expanded and thin, and the sinus extended 1 in. above the orbital margin. He could not have done a Killian operation if he had wanted to, as the bone was too soft; he had performed the Ogston-Luc operation with immediate closure of the wound, and the case had done very well.

Congenital Tumour of the Septum, probably Glioma.—**Frank Rose, F.R.C.S.**—F. D—, aged ten months. Nasal obstruction was noticed at birth. The mother detected a swelling in the left nasal cavity at the age of two months. At the age of four months a pale, smooth swelling filled the left nasal cavity. It had a broad attachment to the septum, but none to the floor and outer wall. Its upper limit could not be determined. The swelling caused slight protrusion of the external nose. A piece was removed for examination and is believed to show the structure of a glioma. Congenital tumours arising from the septum are rare. Two cases have been recorded, both of which were described as gliomata.

The only similar cases of which he had found records were those of J. P. Clarke, in the *American Journal of Medical Science*. They were both males, and had the tumour on the left side, and attached to the septum; there was in them also some distension of the nostril. There was no evidence in either case that the tumour was malignant. The question was whether it was glioma; the microscopical appearances were difficult. He had submitted the specimen to Prof. Andrews and Mr.

Shattock, and they agreed that, as far as one could tell by the microscope, it was a glioma.

Sarcoma of the Left Tonsil.—**Norman H. Pike, B.S.**—The specimen was removed from a female aged twenty-six. Her history was that she had had an "ulcerated" throat over two years ago. For the past year she had noticed, when looking in the glass, that there was a lump on the left side of her throat. She frequently had sore throats and a more or less constant pain shooting up in front of the left ear. She had some stiffness on the left side of the neck and attacks of deafness in the left ear. I first saw her on January 23, 1913. Examination showed the left anterior pillar of the fauces to be pushed forward, presenting a rounded and swollen border; there was some extension of the swelling upwards. Palpation showed the whole mass to be of a cartilaginous hardness. Only a small portion of the tonsil was visible between the pillars of the fauces. Two small upper cervical glands were palpable. She heard the acoumeter at 5 metres with the left ear. On February 3 a general anæsthetic was given. After a preliminary laryngotomy the left tonsil was removed by dissection, through the mouth, together with a portion of the anterior pillar. The tonsil shelled out easily, and there was little hæmorrhage. Care was taken to remove the lingual prolongation from the base of the tongue. The right tonsil was also removed. The pathologist reported a spindle-celled sarcoma limited by the capsule. The right tonsil was normal. The microscopical sections are also exhibited. On February 20 two small cervical glands were removed, one about as big as a hazel-nut, the other the size of a pea.

Mr. PIKE added that it looked as if there was a local recurrence already, but it was only five weeks since removal. Was the prognosis of these cases always bad? The glands removed were examined microscopically and were free from sarcomatous cells.

Dr. DAN MCKENZIE said the prognosis of the condition was bad. Last winter he saw a case in which the course was only six weeks.

The PRESIDENT agreed as to the gravity of the prognosis. He had not seen a case recover in which the diagnosis was beyond doubt, although the tumour was easy to remove by a kind of enucleation.

Tumour in the Maxillary Antrum.—**John F. O'Malley, F.R.C.S.**—F. L.—, aged fifty-four. This patient complains of obstruction in the left side of the nose for four months, pain referred to the teeth, and swelling of the face on the same side. The pain and swelling are getting worse lately. The left nasal cavity is blocked by a greatly enlarged anterior end of the inferior turbinate, on the size of which cocaine and adrenalin have no effect. On the septal aspect of the turbinate the mucous membrane is ragged, and on attempting to pass a probe the bleeding is very free. About the centre of the orbital boundary of the antrum a hard mass can be felt, which, when pressed on, causes the patient to wince and complain of pain in the left upper teeth. Transillumination shows a good crescent on the right side and none on the left. Potassium iodide has been given for three weeks without any result.

Lupus of the Nose.—**John F. O'Malley, F.R.C.S.**—Female, aged forty-one, has had bilateral nasal discharge for three months, said to come on after an attack of "rheumatic fever." The history of the illness is not quite typical of acute rheumatism—*i. e.* swelling of both forearms from fingers to elbows, with blistering of the skin followed by

scaling. No other joints were swollen. The mucous membrane on the septum, floor, and inferior turbinates of both sides looks uneven and sodden and covered in parts with muco-pus; there is some muco-pus in the upper naso-pharynx, but no alteration in the mucous membrane, except around the orifice of the right Eustachian tube, where it is a little swollen. Portion of what appeared to be a granulation-like projection was sent for pathological report. This is not conclusive, but states "that the appearances are suggestive of lupus."

The PRESIDENT thought the appearances suggested sinus suppuration; he could not see any definite granulations in the nose. He had not seen lupus with such a free discharge of pus.

Dr. KELSON said he regarded it as a chronic septic condition, and he suggested that cultures should be made from it.

Mr. LAYTON suggested that the condition was due to very septic tooth stumps. He had seen recently several cases sent by dental surgeons in which there was a septic discharge from the nose, which had cleared up with removal of the septic stumps.

Mr. O'MALLEY replied that the sinuses were clear. The Wassermann reaction was negative. He used cocaine and adrenalin, but did not obtain the pale look of the mucous membrane with the raised pinkish spots which one associated with lupus.

Congenital Syphilis with Intranasal Lesions.—James Donelan, M.B.—Girl, aged sixteen. The stress of the tertiary ulceration fell on the left middle turbinal and septum. There is no perforation, but there was an abscess affecting the anterior border of the septum, which resulted in the present retraction. She has now been treated with mercury and iodides—at first by inunctions, and latterly chiefly with Donovan's solution, for nearly three years. She is so much better that it is thought some operative treatment to improve nasal respiration might be undertaken, as well as, possibly, an attempt to improve the external shape of the nose by means of paraffin. Salvarsan has not been employed in this case.

Dr. FAULDER thought the appearance of the nose might be improved. Before interfering he would have a Wassermann test done. With regard to the suggestion to use paraffin, he asked whether members had experience in elevating such depressions by means of a freshly removed piece of cartilage from another case, or from the same patient. He had done that operation. First, a small incision was made with a tenotomy knife over the nasal bones, then with an elevator a bed was made under the skin for the cartilage, which was then placed in position, and the small incision over the nasal bone sutured. The immediate result was very good. He would show one or two of the cases.

The PRESIDENT thought the only cases suitable for paraffin were those in which there was a hard bony bed or support on which the injected paraffin could rest. He had never injected paraffin, but he had dissected it out in cases where it had wandered among the neighbouring tissues.

Post-diphtheritic Adhesions of Soft Palate.—James Donelan, M.B.—Girl, aged seventeen. The patient suffered from severe diphtheria when aged four. There are post-diphtheritic cicatrices about the mouth. She had also double diphtheritic otitis. When aged six an operation was performed for the relief of the palatal adhesions, and the palate was tied forward by means of ligatures passed through the nostrils for some two

weeks, but the adhesions re-formed. At the age of twelve a double mastoid was performed with successful result. The case is now shown with a view to elicit opinions as to the nature of the operation, if any, that should be performed to re-establish nasal respiration. The patient was one of a large, healthy family, some older and some younger than the patient. The marks about the mouth were said to have been caused at the time of the diphtheria. These lesions were not now so common as they used to be before antitoxin was so freely used.

The PRESIDENT asked whether the adhesion of the palate to the posterior pharyngeal wall and the scars on the lip were the result of diphtheria, or due to syphilis. He had not seen definite ulceration in the palate, even in the worst kind of pure diphtheria.

Dr. BROWN KELLY said the only treatment of use in this case was a broad hook attached to the denture, and worn for months.

Microscopical Section of Pedunculated Growth of Nose.¹

W. H. Kelson, M.D.—Man, aged seventy-two. The section shows much dilated vessels in a connective-tissue stroma. There is no history of epistaxis whatever. Do so-called "bleeding polypi" always bleed?

Dr. Kelson said that Dr. Pegler wished him to say that he now agreed that it was a bleeding polypus, but he considered that the situation of this one had probably protected it somewhat from trauma, and that, therefore, it did not bleed.

Cyst of the Tonsil.—**T. B. Layton, M.S.**—The patient was a girl, aged twelve, who came under observation for a sore throat, without any symptoms definitely due to the cyst.

Paralysis of the Right Vocal Cord and of the Right Half of the Palate (the Facial, Auditory, Glosso-pharyngeal and Accessory Portion of the Vagus involved).—**J. Dundas Grant, M.D.**—The patient, a man, aged twenty-seven, was sent on account of facial paralysis of seven days' duration; this was preceded by pain in the right ear for seven days and discharge from that ear which has now lasted for a month. He had gradual dulness of hearing for six months, and for the last two days his voice has been weak and he experiences a feeling of weakness in deglutition. There is absolute immobility of the right vocal cord close to the middle line; the palate is drawn to the left during phonation; to the laryngeal probe the sensation on the right side of the larynx is less marked than on the left. Taste is complete on the anterior part of both sides of the tongue and on the posterior pillar of the fauces and corresponding part of the tongue on the left side, but it is completely absent on the posterior part of the right side of the tongue and on the right pillar of the fauces. The optic discs, pupils and extra-ocular muscles are normal. The masseters and tongue are normal in their movements. There is no cutaneous anaesthesia or analgesia. No weakness or ataxia of the limbs; the reflexes are normal.

The hearing tests were detailed, and showed marked loss of hearing on the right side with bone-conduction reduced. Rotation test normal. The nerves involved are, therefore, the facial, the auditory, the glosso-pharyngeal, and the accessory portion of the vagus on the right side. There is a bulging of the walls of the right auditory meatus, and in the interior can be detected some papillated granulation-outgrowth, and bare, rough

¹ See JOURN. OF LARYNGOL., RHINOL. AND OTOL., September, 1913, p. 487.

bone is perceptible to the probe in the depths of the meatus and various parts of the walls, but the pain on probing was so great as to prevent it being carried out with any exactness. No specific history was obtainable, and no evidences of previous specific infection. The combination of signs indicates disease of the inner apex of the petrous bone, and in view of the fact that there is some flattening at the apex of the right lung where there has probably at a previous time been an active focus of tubercle, the likelihood is that in this case there is tubercular disease of the bone.

Hæmorrhage into the Right Vocal Cord, the Result of an Accident at Football.—**W. M. Mollison, M.C.**—A male, while playing football a week ago, received a kick in the neck on the thyroid cartilage, a little to the right of the middle line. He experienced a feeling of shock and of suffocation; this passed, and he found his voice was very weak; he had, too, considerable pain on swallowing, and had a constant desire to swallow. Seen within an hour of the accident he could scarcely speak, and examination of the larynx showed slight swelling of the right vocal cord. On attempted phonation the cords approximated. Two days after the accident the voice was still weak, but normal in character, and the patient felt well, though on walking he again experienced a feeling of suffocation, but in much less degree than before. There was evident hæmorrhage into the right cord, while the left was normal.

PROCEEDINGS OF THE SCOTTISH OTOLOGICAL AND LARYNGOLOGICAL SOCIETY.

Meeting in the Victoria Infirmary, Glasgow, May 31, 1913.

DR. BROWN KELLY *in the Chair.*

Reported by DR. W. S. SYME.

(Continued from p. 502.)

Demonstration of Method of taking the Temperature of the Respiratory Current in the Naso-pharynx (*published in extenso, p. 515*).—**Dr. Brown Kelly.**

Dr. SYME said this was a very interesting instrument, and gave a reason for conclusions they had all come to, namely, that to have results of nasal obstruction it is not necessary that the obstruction should be severe. Dr. Kelly has shown the alteration in temperature where there is partial occlusion of one nostril. One can understand how it is that one gets naso-pharyngeal phenomena.

Sir STCLAIR THOMSON thought that Dr. Kelly's results rather upset one's established and orthodox views, because it entirely negatived the experience of Dr. Macdonald in our own country and other observers both at home and abroad. They were satisfied that the inspired air was raised to the normal temperature in its passage through the nose, and that the lungs had nothing whatever to do with the warming of the inspired air. Dr. Kelly's method seemed to show that the inspired air was considerably warmed after it had descended into the lungs, and that the warming was

not effected altogether by the nose. Personally he thought the warming was all carried out by the nose.

Dr. KELLY said he thought the figures of these other observers came to much the same as his own.

Chronic Purulent Otitis Media with Labyrinth Symptoms; Radical Mastoid Operation.—Dr. J. Galbraith Connal.—Woman, aged forty-five. Discharge from left ear for about twelve years, but occasionally dried up. One fortnight before coming under observation, as the result of cold, there was renewed discharge and pain in the ear. The pain became very severe, and tinnitus, "like an engine going in the ear." She complained of intense sickness and vomiting, and this had continued for four days before seeing her. She had "shivery" feelings but no definite rigor. Giddiness, with tendency to fall to the left side. Nystagmus to right. Syringing with hot or cold water gave no reaction in left ear, but gave marked reaction when right ear was syringed. W.L., $\frac{6}{46}$; tuning forks—Weber to right; C and C_1 heard only by bone-conduction for a short time; C_4 not heard. Ear examination showed foul-smelling discharge in canal and sagging of postero-superior segment of canal. There was no swelling over mastoid. Slight tenderness on deep palpation. Temperature, 100.4° F.; pulse, 90. The pupils responded to light directly and consensually; the optic discs were congested and blurred on the inner margins, but as she was a hypermetrope these signs might have been due to eye-strain.

Radical Mastoid Operation.—Lateral sinus lying far forward and very superficial. Antrum filled with foul-smelling cholesteatomatous material. Fistulous opening in external semicircular canal, but no evidence of any granulation or pus from it. *Bacteriological report:* Pus from mastoid showed the presence of *Streptococcus pyogenes*, *Diplococcus catarrhalis*, and *Bacillus proteus vulgaris*. Made a somewhat slow recovery.

Dr. ADAM was much interested in this case, having just seen a similar one in a child with headache, staggering gait, vomiting, nystagmus and exaggerated knee-jerks; no definite history of suppuration; a small amount of cholesteatoma found in middle ear; operation next day. Cholesteatoma packed in antrum, aditus and middle ear, with erosion in the semi-circular canal. The interesting point about the erosion was that there was no caloric reaction, nor was the fistula symptom present. Cholesteatoma seemed to interfere with the ordinary nystagmus tests. He asked whether in those cases of labyrinth irritation with nystagmus it had been noticed that the knee-jerks are increased? Personally he thought the ordinary nystagmus tests increased the knee-jerks.

Dr. THOS. BARR was disposed to think that in these cases the labyrinth is capable of recovery without an extensive labyrinth operation much more frequently than is usually supposed. The radical mastoid operation, even where one finds an opening into the labyrinth, is not rarely followed by the disappearance of the special labyrinth symptoms, which may have been alarming. He felt that unless there are very gross changes in the labyrinth wall one is not justified in operating on the labyrinth without waiting a little time to see the effect of the radical mastoid operation.

Dr. DAN MCKENZIE said he was much interested in Dr. Connal's case, which exemplified, what is so frequently seen, that in a case where there is obvious ablation of one portion of the labyrinth function from disease, the simple mastoid operation may be followed by the recovery of the patient. For some time he had been inclined to be radical in his

attitude towards the labyrinth operation; he thought, however, that the future would show a reaction on the part of the surgeons with regard to these cases. One could not, of course, lay too much stress on this case, because it was a cholesteatoma, for the cholesteatomatous process is often preceded by the formation of a bony wall which, progressing in advance of the disease, shuts off the labyrinth spaces. In cholesteatoma with labyrinth involvement the chances of the radical mastoid operation alone are often quite good, but he was inclined to doubt cases of another type. For instance, in acute labyrinth disease associated with acute middle-ear disease, he would be inclined to do the labyrinth operation, for in these cases where the radical mastoid operation alone is done, meningitis may set in as the result of the shaking up produced by the simple operation. He did not think that the indications for the labyrinth operation were by any means finally settled.

Dr. J. S. FRASER opposed the view put forward by Dr. Barr and Dr. McKenzie. Personally he thought that Dr. Connal had taken a big risk. The operation turned out quite well, but it might have turned out differently. From the history of the case it must have been pretty evident that the patient had recently had an acute labyrinthitis. The difference between serous and purulent labyrinthitis was only one of degree; it may be that the inflammation goes a certain length and then stops, but how can one tell? If one operates upon a case where an acute attack of labyrinthitis has existed a short time before, there is great likelihood of meningitis following the radical mastoid operation alone. In Vienna it is thought that the risk to the patient is less in the presence of an acute, recent labyrinth disease (latent labyrinthitis) if, at the time of the radical mastoid operation, one drains the labyrinth. He did not agree that it was a very serious and dangerous operation; he believed it was not. He thought that probably the risk of operating upon a case like this, and only doing the radical mastoid operation, was greater than the risk incurred than if the labyrinth operation was done at the same time.

Dr. SYME thought that the question of labyrinthitis was by no means easy. Dr. McKenzie suggested that cases of acute ear suppuration showing labyrinth symptoms called more often for operation than chronic cases of the same nature. Against that he would say that in some cases of acute middle-ear suppuration one gets labyrinth symptoms which clear up. At first one gets nystagmus of the irritative variety, that is toward the side of the disease, and due, he took it, to congestion of the labyrinth. The caloric reactions are more active. As the congestion increases and diminution or abolition of the labyrinth function takes place the nystagmus disappears, the hearing becomes more impaired and the caloric reactions are not obtained. After a few days and with subsidence of the acute middle-ear condition the functions of the labyrinth return. In such cases the suppurative process has not invaded the labyrinth, and it would be bad treatment to open the internal ear. In Dr. Connal's case the labyrinth was evidently destroyed. There was a fistula but no fistula symptom, and there was no response to the caloric tests, both, therefore, confirming one another. There was no possibility of the hearing returning. In such a case he would certainly advise the performance of the labyrinth operation.¹

Dr. ADAM asked Dr. Fraser if when there was clear evidence of a functioning cochlea he would advise a labyrinth operation simply because

¹ *À propos* of this discussion, see article by Neumann in *Le Larynx*, No. 4, 1912, "Circumscribed Suppurative Labyrinthitis."—W. S. S.

there are symptoms of labyrinth irritation? In cases of erosion one might get no labyrinth response at the time of the acute symptoms; yet get it later on. In a similar case he had got it a year afterwards. Could one conceive of a better substance than cholesteatoma for impeding the caloric and pressure reactions?

Dr. FRASER admitted that a patient with recent acute labyrinthitis on whom only a radical mastoid operation was performed might recover. His personal experience of latent labyrinthitis was not large enough, but in those places like Vienna where these operations had been done very frequently, it had been found that the patient ran less risk of meningitis if the labyrinth operation were performed as well as the mastoid operation. To look for a moment at this case here—Weber to right (good side), absence of caloric reaction—the fact that C4 was not heard proved nothing. The noise apparatus should be applied to the sound ear. In a case like this where there had been recently intense sickness and vomiting in addition there was no doubt about there being pus in the labyrinth; in his opinion the case had been one of acute purulent (latent) labyrinthitis, and the labyrinth operation should have been performed at the same time as the radical mastoid.

Dr. CONNAL replied that at the operation there was no evidence of pus or granulations around the erosion in the external semicircular canal.

Right Vocal Cord Inflamed and Restricted in Movement.—Dr. J. Galbraith Connal.—Man, aged forty-two. Hoarseness for fifteen months. No pain; no difficulty in swallowing. With exception of present illness, always had good health. Had a primary sore twenty years ago. Wassermann positive. Has been on antispasmodic treatment for four months, at first by his own doctor and latterly at the hospital, without benefit.

Dr. BROWN KELLY said he had seen a cord like this remaining red for months, and he had been anxious as to the possibility of malignancy and as to whether he was right in waiting; ultimately the whole condition cleared up.

Dr. D. R. PATTERSON said he thought syphilis could not be excluded. Under the treatment the patient stated he had improved and that his voice had returned to what it usually was. The doubtful point about the condition was the limitation of the disease to one cord.

Sir STCLAIR THOMSON said he would leave the case alone. The Wassermann reaction was positive. The impairment of movement was in the anterior half and not in the posterior, where one is more apt to look for malignant growths. He thought it was simply due to a specific deposit which is absorbing.

Dr. FULLERTON thought the chances were that it was specific. The possibility of a tuberculous condition must, however, be borne in mind, for sometimes one finds a tuberculous invasion in a specific subject which gives rise to baffling appearances.

Dr. CONNAL replied that the chest and sputum had been examined with negative results.

Chronic 'Superficial Inflammation and Ulceration of Mucous Membrane of Larynx and Pharynx of doubtful origin and of several years' duration, with somewhat similar Skin Lesions.—Dr. J. Adam.—Man, aged thirty-three, four years ago noticed difficulty in swallowing solids; this slowly increased, but has not advanced in last

two years and is not absolute. Ulceration in month, first noticed two years ago, has since persisted. No personal or family history of syphilis. Tubercular disease of knee seventeen years ago (excision).

On hard and soft palate, back of pharynx, epiglottis, are superficial ulcerated patches throwing off epithelium; those on palate and fauces come and go, that on pharynx has been persistent, but without extending for at least four months. The whole mucous membrane is congested, that over epiglottis, arytaenoids and ventricular bands being thickened; cords do not seem affected. Fauces and epiglottis are slightly contracted. Superficial glossitis with scar on dorsum. Small crusts on either side of quadrangular cartilage.

Slight redness of skin of cheeks and temples, changing ultimately to brown mottling, interspersed with white atrophic areas. There is no ulceration on skin, but on the back there have been for months three red spots, size of a sixpence, one atrophying in centre and one throwing off psoriasiform scales. Prepuce contracted. No enlarged glands in groin. All the lesions are chronic and painless. The patches on fauces yield mainly *Staphylococcus albus*, some streptococci and pneumococci, no spirochaetes. Wassermann doubtful positive. Hg., salvarsan and removal of septic teeth gave no improvement; K. I. causes wide-spread bullous dermatitis.

Dr. PATERSON said, on the face of it, one might almost say it was specific were not the long history against it; they looked so very like specific patches. On the other hand, he had met with one or two similar cases where he had had considerable difficulty and where no real improvement resulted from specific treatment. One had to consider whether it might not be a pneumococcal invasion, more particularly as pneumococci were present on these patches—that had to be kept in view. Those cases are extremely doubtful and call forth a great difference of opinion.

Sir STCLAIR THOMSON agreed with Dr. Paterson that if one had to make a snapshot diagnosis one would say it was a case of secondary syphilitic disease. It shows how careful one ought to be. This case has gone on for four years, and, of course, could not possibly be syphilis, although secondary symptoms may come and go it is unlikely that they would be continuous all that time.

Dr. WALKER DOWNIE had seen the patient with Dr. Adam four months ago. Some years since he had recorded a somewhat similar case. In the latter the symptoms persisted in spite of prolonged specific treatment, and the condition continued for several years. A membrane formed and peeled off, leaving a raw surface. The patches became less and less in size, and finally disappeared. The fauces subsequently became very narrow, the result of a sclerosing process. He could get no explanation of the cause of the exudate from the various pathologists who were kind enough to examine it for him.

Dr. FULLERTON asked if there was any albumen in the urine. He had seen one or two cases where, with the exception of the membrane on the surface, there was a similar condition. In his case the patients were the subjects of renal disease, which was probably a predisposing factor.

Dr. BROWN KELLY was surprised that no one had suggested pemphigus or erythema multiforme. He did not think it was at all like a specific condition. The patches of loose epithelium and the chronicity recalled pemphigus.

Dr. ADAM replied that at first sight he thought it specific. The Wassermann reaction in this instance did not count for very much; it was made by two different observers—the one thought it slightly

positive, the other negative. The history was decidedly against syphilis, and his opinion was that it was not syphilitic. He showed it to Dr. Morton, the dermatologist, and he came to the conclusion that it was syphilitic. His own opinion was that it was pemphigus because of the skin-lesions. There was no albumen in the urine.

Encapsulated Right Temporo-Sphenoidal Abscess; Operation; Removal of Abscess Capsule; Improvement; Death seven weeks later from Second Abscess in Frontal Lobe.—Dr. W. S. Syme.—

J. Y——, aged twenty, admitted to hospital April 1, 1912. Right chronic middle-ear suppuration of long standing. Partial facial paralysis for several days. Some pain recently. April 2: Radical mastoid operation. Dura found exposed in tegmen. Facial paralysis disappeared after operation, but reappeared ten days later. A week after operation the temperature rose to 101.4° F., but returned to normal next day. Patient had a slight tonsillitis, otherwise post-operation course normal, and there was nothing in patient's condition to suggest the presence of intra-cranial complication. Left hospital on April 27, attending subsequently as an out-patient. On May 11 he received a fairly hard blow on the top of his head. Next day he complained of headache. His family medical attendant saw him on 14th. Severe frontal headache then. Pulse, 84; temperature, 99° F. May 15: Pulse, 72; temperature, 98.5°. May 16: Pulse, 60; temperature, 98°. May 17: Pulse, 52; temperature, 98°; vomiting, dilated pupils, headache very severe. Readmitted to hospital on 17th. The pulse was then 52; there was very severe frontal headache, sighing respiration. Photophobia. No rigidity of neck. Reflexes: Left knee reflex more active than right, but right abdominal and right cremasteric reflexes more active than left. No ankle-clonus, no Babinski, no Kernig. Some loss of power in left hand and left leg. Sense of smell normal. Double optic neuritis. No spontaneous nystagmus. Caloric reaction; cold water in right ear gave quick and strong reaction; nystagmus to left. Rinne decidedly negative. Lumbar puncture: Fluid clear, sterile, pressure much increased. Mastoid cavity opened; tegmen atri and tympani absent, and dura bulging. Dura opened, and large temporo-sphenoidal abscess evacuated. Thick greenish stinking pus to the amount of quite an ounce and a half. Abscess cavity mopped out and found to extend deeply in all directions. Tube inserted and stitched to dura. Examination of pus showed a diphtheroid bacillus in pure culture. Temperature rose in four hours to 105.6° F. and then dropped to 98.6° F.; pulse, 140. Patient showed much improvement in every way next day. The following day, however, he became comatose; pulse, 56. Lumbar puncture: Increased pressure, fluid turbid but sterile (lymphocytes and large number of polymorphs). Tube removed from abscess. Some necrotic tissue presented; opening in dura enlarged. The necrotic tissue was grasped with forceps, and with slight traction the abscess capsule was extracted. It was thick and leathery, and evidently of long duration. Larger drainage-tube introduced. Result: Pulse, 100; mind clearer. Two days later, pulse, 80; cerebro-spinal fluid still turbid, sterile, but pressure less. Headache disappeared. Temperature irregular for a week, and then settled down. Retention of urine on May 22 and this continued for a week, necessitating catheterisation. Urine smoky; trace of blood. A pustular eruption appeared on back on May 23. Temperature and pulse normal from May 29 to June 21. Patient quite sensible and at times cheerful. Tube gradually shortened, and abscess cavity became quite obliterated.

June 22: Pulse-rate and temperature rose somewhat, and he had an attack of sickness and vomiting. After this temporary improvement for two or three days, succeeded by rise in temperature and pulse for a day or two, and then again temporary improvement. Patient's mind quite clear, but he was somewhat dull. On July 1 a neurologist saw him, and though the signs were indefinite, they appeared to point rather to the cerebellum. The temporo-sphenoidal region was, however, first explored, but with negative result. Two days later, in reporter's absence, Dr. Connall explored the cerebellum, but also without result. Patient died on July 4, and on *post-mortem* examination an abscess was found well forward in the right frontal region. Abscess capsule shown.

Malignant Disease of Left Side of Larynx. Man, aged seventy-two.—Dr. W. S. Syme.

Case of Submucous Cleft Palate.—Dr. W. S. Syme.

Specimens, etc.

Dr. Brown Kelly showed—(a) Preparations of œsophagus; dissections illustrating normal anatomy; pathological specimens. (b) X-ray plates showing foreign bodies in œsophagus and lung, dilatation of œsophagus, mediastinal growths, etc. (c) Killian's apparatus for suspension laryngoscopy.

Dr. Albert A. Gray showed—(a) Microscopic preparations from cases of otosclerosis; (b) microscopic preparations from cases of deaf-mutism; (c) microscopic preparations showing changes in the cells of the ganglion spirale of a deaf cat; (d) microscopic preparations showing the cochlea of a woman, aged 101, who was quite deaf during life; (e) microscopic preparations showing the eroding effects of cholesteatoma; (f) microscopic preparations showing the existence of a nerve ganglion in the temporal bone of the human subject hitherto undescribed. The ganglion is possibly an abnormality in this special case.

Dr. GRAY said he had found a plexus by chance when examining the middle ear of a sheep. He found a remarkably rich plexus of nerves formed by branches of the pneumogastric and facial nerves in the posterior wall of the bulla of the sheep, and made a mental note of it. Shortly afterwards, when examining a specimen of the human middle ear cut in thin sections, he found that just at the base of the stapedius muscle and external to it there was a comparatively large ganglion. At first he could not believe that it was a ganglion it was so remarkable that it had not been observed previously. He wrote a paper on the subject, and subsequently read it at the Royal Society of London. The specimen was shown to Prof. Elliott Smith, of Manchester, who said there was no question about the ganglion. Dr. Gray had other specimens, but probably they were cut too thick and did not admit of very satisfactory examination. On the other hand, this condition might be an abnormality. In one other specimen he had discovered two or three ganglion nerve-cells, but nothing like the large mass shown in this preparation. Probably there was normally a minute ganglion, and in this particular case he had happened to strike an abnormally large one.

PROCEEDINGS OF THE FRENCH SOCIETY OF LARYNGOLOGY, OTOTOLOGY AND RHINOLOGY.

Meeting May 14, 1912.

President: G. GELLÉ (Paris).

(Translated by H. CLAYTON FOX, F.R.C.S.I.)

(Continued from p. 330, vol. xxviii, No. 6.)

Our Present Technique for the Treatment of all Forms of Sinusitis by the Endo-nasal Route.—Vacher and Denis (Orleans).

—In the case of maxillary sinusitis, the author makes a very large opening through the alveolus with Lermoyez's perforator and currettes the whole of the sinus with a curved instrument. He does not consider it necessary to remove the inferior turbinated body in all cases. The intra-nasal route should be chosen for ethmoidal sinusitis and even for frontal, thus avoiding external cicatrices and facial anæsthesia.

For frontal sinusitis with free escape of pus a small probe is introduced into the sinus under control of the screen; this is replaced by a larger one, after which it is often possible for the patient to irrigate the sinus himself. The author has, in this way, treated thirty-eight cases of frontal sinusitis with success.

CLAOUÉ (Bordeaux) endeavoured to explain how his method of operating was confused with others more or less similar. (a) His method differed essentially in principle from that of Mikulicz (opening with a curved bistoury under the inferior turbinated body, the latter being respected), which can only claim effecting a cure by irrigation as in the alveolar methods. (b) Neither did it resemble Rethi's procedure, which had for its object complete curettage of the sinus through an extensive opening in the middle meatus. (c) It could not be confounded with the practice adopted by Vacher, who expresses himself as follows: "The opening must be as extensive as possible so as to allow of thorough curettage, although it may be necessarily incomplete." Through this opening, with the turbinated body not disturbed, he introduces bent currettes in every direction so as to clear out the sinus completely if necessary (*Annales*, 1909). Vacher's procedure rather resembled Rethi's than his own. The author does not curette if proliferations present themselves at the mouth of the opening, but excises them to facilitate drainage. In conclusion, he observed that the mucosa and its inflammatory vegetations are amenable to treatment without curettage, provided that the sinus be freely drained and aerated.

LUC (Paris) prefers to open freely, for a large aperture gives a better view; he thinks it preferable to operate externally, and not deliberately to choose the endo-nasal route, which is sometimes difficult of access, and does not enable one to estimate precisely the condition of the sinus.

Radical Cure of Maxillary Antritis and Local Anæsthesia.—

Pautet (Limoges).—The author reported five cases operated on under Luc's anæsthesia. For making the artificial opening he has tried various well-known instruments, and none have given him satisfactory results. He then tried the electric burr, and with it has been able to respect the inner surface of the inferior turbinated body, and obtain a large opening.

Maxillary Sinusitis operated on by Claoué's Method.—Fournier (Marseilles).—In nine cases operated on by the intranasal (Claoué's) method, even in those of old standing, the results were excellent. He did not curette but simply swabbed the cavity. Cures have generally been obtained in two months. Fœtor and discharge first disappeared, then the crusts, and finally the pus. For anæsthesia he swabs the nasal fossa with cocaine, and introduces into the cavity a strip of gauze soaked in Bonain's mixture. He uses the electric burr.

CLAUOÉ (Bordeaux), in a recent communication, embodied the statistics relating to this operation, and all agree that in 80 per cent. of cases endo-nasal trephining sufficed to bring about a cure of simple chronic, uncomplicated maxillary sinusitis, the form most frequently coming under our observation. He was aware that many of his colleagues were unfavourably disposed to the operation, but he thought that serious consideration had not been given to the objections raised. The difficulty in operating, hemorrhage and crusting rhinitis from partial resection of the inferior turbinated body more recently spoken of, had not been experienced by him. He believed that scepticism arises from the preconceived notion that "one has difficulty in imagining that a mucosa so profoundly affected and œdematous as in the case of chronic maxillary sinusitis can be cured otherwise than by its careful and total removal." But facts go to demonstrate the contrary. Besides, to reason thus, is it not flying in the face of what happens in general surgery? Does not purulent pleurisy yield to free drainage after resection of a rib alone at a dependent situation? One does not decorticate the lung for these simple cases, and yet the pleural lesions are more extensive in these cases than those of the mucosa in maxillary sinusites. Does not purulent cystitis yield to suprapubic cystotomy, that is to say, again to free and prolonged drainage without the need for excising or curetting the diseased mucosa. Why should the maxillary mucosa be an exception to the rule?

Reinfection of the Maxillary Sinus after Radical Cure from Post-operative Death of the Pulp of a Wisdom Tooth.—Cabouche (Paris).—A girl, aged twenty, was attacked with maxillary sinusitis following the extraction of a wisdom tooth. The sinus was curetted and a large mucous polyp was found blocking the nasal opening. After the operation all seemed well, but sixteen days later the patient returned with a fœtid discharge; the canine fossa was closed, there was some swelling, and a probe introduced gave vent to pus. The author inserted a gauze wick for drainage, and subsequently the patient recovered. On examining for the source of infection the antrum was found to be lined with healthy granulations except at its lower part. The wisdom tooth was found to be the seat of peri-odontitis, and had been responsible for the re-infection.

Subacute Emphysema and Fatal Syncope after Bougieing the Œsophagus.—Lubet-Barbon (Paris).—A woman, aged sixty, suffered from difficulty in deglutition. The author passed an olivary bougie, which was arrested at the upper third of the œsophagus by a stricture. The latter was easily overcome and the bougie was withdrawn free from blood, food or fœtor. Soon afterwards the patient experienced severe pain behind the larynx and between the shoulders, and the voice became hoarse. In the evening dyspnœa became intense, and the whole of the neck was swollen. The following day the face was in a similar condition, and crepitation was present. Absolute rest was ordered. The next day the swelling had

diminished, and she was able to open her eyes. On the following day the patient was progressing favourably, but had a sudden attack of suffocation, which proved fatal.

GUISEZ (Paris): The cause of this false passage was certainly the bougie, an instrument which ought to be proscribed. Catheterisation should be carried out with a soft olive, which perhaps gives less valuable information, but is safer. He thought in this case there was cancerous ulceration, and he related some cases of mediastinitis resulting from the passage of œsophageal bougies, cured by making an opening along the sterno-mastoid, turning aside the œsophagus, and drainage. It is necessary to incise to the upper limit of the emphysema. Through this opening retro-œsophageal drainage can be practised and cure obtained (eight authenticated cases).

MOLINIÉ (Marseilles) thought that these accidents were not due to the choice of instrument, but to the special pathological condition of the œsophagus. Cases have been cited of œsophago-malacia attended with special friability of the œsophageal mucosa, and of perforation produced independently of any intervention.

SEUR (Paris) had experienced a case of this kind. At the autopsy he found an erosion which had extended to the pleura and involved the lung. In this patient the neoplastic focus adhered to the pleura and lung. In Lubet-Barbon's case he thought dilatation had produced a rupture—the cause of the trouble. The author agreed with Guisez in regard to the treatment after perforations.

Laryngeal Hæmorrhage with Subcutaneous Emphysema of the Laryngeal Region.—Levesque (Nantes).—An adult in perfect health expectorated several small quantities of arterial blood, without cough or exertion; then a swelling in the pre-laryngeal region appeared, with subcutaneous emphysema. It was really a case of lesion of the laryngeal mucosa due to chemical vapours (chlorine and bromine). Hæmorrhage having occurred in the left ventricular region, the patient, in expectorating, caused air to penetrate at the seat of the damaged mucosa.

Abstracts.

NOSE.

Davis, Geo. E.—What is the Best Type of Radical Frontal Sinus Operation? View from Simplicity of Technique, Time of Healing, and Cosmetic Results. "Annals of Otology," etc., xxi, p. 684.

The author's method is not intended to supplant the Killian operation, but to simplify technique and enhance cosmetic effect. He advocates the use of preliminary skiagrams, the use of autogenous vaccines to hasten convalescence, and entering the sinus intra-nasally through the agger nasi cell before operating. The technique of his external operation is, briefly, incision in brow line from supra-orbital notch to articulation of frontal, nasal and maxillary bones; the removal of a strip of bone 6-8 mm. wide from anterior sinus wall from a point above supra-orbital notch to nasal process of maxilla and down the latter 5-8 mm. if necessary (the latter gives access to anterior and posterior ethmoidal cells and sphenoidal sinus). After curetting the sinus, etc., it is lightly packed with gauze, the latter emerging from the lower end of the wound, sutured save at that point. Gauze removed second day and an adhesive strip

adjusted to lower end of wound. The advantages claimed are: (1) simplified technique; (2) direct inspection and access; (3) better cosmetic effect.

MacLeod Yearsley.

Tilley, Herbert.—**Orbital Complications of Accessory Sinus Suppuration**
 "Proc. Roy. Soc. Med." (Clinical Section), January, 1912.

Case 1: Male, aged seventy-one, complained of double vision, but *not of headache or nasal discharge*. A small, tense swelling was present at inner side of the right eyeball, which was proptosed. Nasal examination showed pus from all sinuses on right side. Killian operation: Posterior wall and floor of sinus found to be destroyed; antrum, ethmoidal cells and sphenoidal sinus contained pus; good recovery. Case 2: Female, aged thirty, suffered from "inflammation of the right eye and face" of five weeks' duration. Right eye proptosed and globe hidden by œdematous conjunctiva; fistula below inner angle of eyebrow: pus in right nose and naso-pharynx: temperature, 102° F. Killian operation: Sequestrum from posterior ethmoidal cells; antrum full of caseated pus. Recovery retarded by pleurisy; slight deformity. Case 3: Female, *aged thirteen*, had had purulent discharge from left nostril for four weeks. Seven days ago "sore throat with shivering fits." Next day pain in left eye and swelling of upper lid followed by vertical headache and severe epistaxis. Examination: Eyelids on left side swollen; marked proptosis; conjunctiva œdematous; ocular movements impaired; fundus normal. Pus in left middle meatus. Operation: Removal of anterior and left middle turbinal. Killian incision externally; pus escaped from inner part of incision and from floor of left frontal sinus; anterior wall removed and mucosa curetted; cavity packed till obliterated.

J. S. Fraser.

EAR.

Ballance, C. A.—**A case of Septic Thrombosis of the Left Sigmoid, Left Cavernous, and Left Inferior Petrosal Sinuses, with a Suggestion for Treatment in Future Cases.** "Lancet," October 12, 1912, p. 1001.

A paper read at the International Congress at Boston. Boy, aged twelve, suffering from left scarlatinal suppurative otitis since the age of two years. Serious symptoms of one week's duration. At the operation every cell in the mastoid was lined with gangrenous mucous membrane, and the antro-tympanic cavities contained cholesteatoma. The sigmoid groove contained pus, the sinus was thrombosed, and was followed nearly to the torcular. The jugular was divided between ligatures and its tributaries tied. Lumbar puncture gave an ounce of opalescent fluid. Eight days later signs of cavernous sinus thrombosis appeared, and a second intervention, exposing that sinus by the Hartley-Krause incision for operation on the Gasserian ganglion, was performed. At the same time a meningo-cortical abscess of the cerebellum was found. A rigor occurred next day, the temperature rising to 107° F. The patient died next day. At the autopsy the left inferior petrosal sinus was found full of pus, and there was septic clot in the left half of the circular and the left half of the transverse sinuses. The author reviews the literature and discusses the causation and symptoms of thrombosis of the cavernous sinus. He suggests that in future cases in which the inferior petrosal sinus is infected, the jugular bulb should be laid open, so that the opening of the sinus could be seen and its irrigation carried out from the bulb to the cavernous sinus.

MacLeod Yearsley.

REVIEW.

Lehrbuch der Krankheiten des Ohres und der Luftwege, einschliesslich der Mundkrankheiten (Text-Book on Diseases of the Ear and of the Air-passages, including Diseases of the Mouth). By Prof. DENKER (Halle) and Prof. BRÜNNINGS (Jena). With 305 illustrations in the text, a large number being coloured. Jena: Published by Gustav Fischer.

As a good practical treatise on diseases of the organs of hearing, devoid of all superfluous padding, this work must take a very high place. It is throughout clear, and wherever simplicity is possible it is perfectly simple, though where details are necessary they are given with every fulness. In construction the work follows the classical lines and begins with the anatomical remarks, which form an excellent guide to the anatomy of the temporal bone and auditory structures. The various methods of examination are detailed, and we observe a special notice of methods of percussion and radiography of the temporal bone. In regard to the former it is insisted on that a negative result should by no means lead one to exclude the possibility of the presence of an empyema of the mastoid cells. Many practical points stand out among those which are more stereotyped: for instance, in an acute "genuine" suppuration of the middle ear the perforation, when once formed, does not increase in size (p. 96), also that as the result of comparative observations carried out in his former clinic in Erlangen, Prof. Denker finds that in purulent otitis the air-douche is most serviceable, and that there is no foundation for the idea that extension of suppuration to the mastoid is more frequent in those cases in which the air-douche is used, while he is convinced that the early employment of this inflation leads to quicker restoration of the hearing than occurs without it (p. 98). He thinks the so-called "dry" treatment inferior to Bezold's boric acid insufflation (p. 102). Relaxation of the tympanic membrane is attributed to Eustachian stenosis, the same condition also giving rise to an actual bending of the malleus at its neck, not merely an indrawing of the malleus as a whole (p. 85). We observe no reference to the apparent indrawing of the left membrana tympani, which is frequently noted in quite normal cases. He is a strong advocate for inflations in chronic catarrh of the middle ear, but very wisely insists that they can only be expected to be permanent if the causes are removed. The chapters on chronic suppuration are very complete, and the distinction between those with a central perforation and those with the parietal form combined with cholesteatoma is insisted upon (pp. 120, 122). Tuberculosis of the middle ear is well described. It is interesting to turn to the burning question of sinus thrombosis, in regard to which the author is in favour of the avoidance of ligation of the jugular vein, which he describes as appearing at first very "enticing or misleading," the statistics showing that the results are quite as good without, and we may generally feel assured that a parietal thrombus loses its danger owing to the bactericidal action of the blood when once the primary focus of suppuration is cleared out. The exceptions to this rule are candidly set forth (p. 159). In a work by Denker we naturally turn to the chapter on otosclerosis, a subject with which his name is so much identified. He is inclined to think that the phosphorus or phytin treatment is of some value (p. 182). The chapter on deaf-mutism is a very inspiring one; the author dwells upon the value of the residua of hearing-power, and supports Bezold's view that for these residua to be of use for the hearing of human speech, they should include that portion of

the field of audition lying between b^1 and g^2 (p. 200); he concludes this chapter by saying that when we keep before our eyes the fact that nearly one third of all deaf-mutes have a greater residuum of hearing power than is sufficient for vocal instruction, it becomes obvious how significant is the social responsibility of the aurist in his work in institutions for the deaf and dumb (p. 202).

Prof. Denker deals also with diseases of the nose and accessory cavities in a very thorough manner. In regard to the function of these cavities, he feels unable to ascribe to them any particular physiological rôle, except that the presence of olfactory epithelial layers in these cavities in the case of the macrosomatic mammals suggests that they may constitute olfactory areas (p. 228). Some valuable data are given with regard to the position of the head in radiography of the sinuses, but the results are, of course, to be interpreted in the light of their clinical features (p. 240). He warns against the too forcible employment of suction apparatuses (p. 241). Submucous resection is shortly but clearly described, and the opinion is expressed (p. 260) that in children over five years of age submucous resection of the septum produces as a rule no disturbance of development if the resection is not carried too near the dorsum. The various forms of treatment for ozæna are shortly described, and naturally the greatest dependence is on irrigations. The author also speaks with favour of the relief afforded by submucous injections of paraffin (p. 280). He draws a distinction between simple atrophic rhinitis, of which a prognosis is doubtful, and ozæna as such, in which he considers it altogether unfavourable so far as complete restoration is concerned. He notes, however, that crusts and fætor diminish in the later years of life, and may even completely disappear (p. 288). In the treatment of synechiæ in the nose the value of chromic acid might have found a place, and in the section on anæsthesia of the nasal mucous membrane its effect in producing a subjective feeling of stenosis might well have been mentioned. On page 288 we presume that "*Einheilung*" is a misprint for "*Einkeilung*," but we merely mention this as a curiosity and almost an unique occurrence in this admirably edited work. While giving every value to intra-nasal treatment, the author makes out a very strong case for the radical operation on the antrum devised by himself, and includes the excision of the bony margins of the pyriform opening; he asserts that there is no tendency to subsequent disfigurement. As regards the subsequent effect of partial removal of the inferior turbinate body, he finds that he has never observed any increased tendency to the formation of crusts nor to the liability to catarrh (p. 326). He is greatly in favour of local anæsthesia, which he describes fully (p. 327). He is an advocate of Killian's radical operation for the frontal sinus, and in regard to ethmoidal disease, discussing the question of intra-nasal or external operation, he formulates a rule that when there are threatening intranasal symptoms, we must not lose time with intra-nasal proceedings, but at once effect a free opening of the ethmoidal labyrinth from outside (p. 340). For the removal of even malignant growths in the nose and nasal cavities the author recommends an extension of his maxillary antrum operation (p. 361), and he extends its sphere even to the naso-pharynx (p. 376).

Prof. Brünings deals with diseases of the mouth and throat. Many of the illustrations taken from the work of Mikulicz and Kümmel and from Dr. Hennig's beautiful oil paintings on diseases of the mouth are most instructive. They show freely the distinctive characters of aphthous stomatitis and thrush respectively, and draw attention to the sudden extensive outbreak of miliary tubercles in the mucous membrane of the

mouth in advanced phthisis, which are probably often miscalled thrush (p. 395). He takes a very judicial attitude with regard to enucleation of the tonsils, holding very properly that it is to be recommended chiefly in those cases in which chronic inflammatory degeneration of the bodies has taken place in association with cryptogenic infections and rheumatic disease (p. 434). He is in favour of a powerful snare, which he considers frequently effects a complete enucleation, and when in extirpation he has loosened the tonsil from its bed he finishes the severance of the hilus by means of the snare (p. 436).

The familiarity of Prof. Brünings with physical science gives its special character to his study of diseases of the larynx, and we find many questions considered from the physical point of view with an unusual degree of thoroughness. This adds greatly to the individuality of the treatment and to the interest of the statements. The method of direct laryngoscopy receives considerable attention without allowing of the eclipse of the original—now called—indirect. The use of external counter-pressure on the larynx during direct laryngoscopy is strongly advocated, and Prof. Killian's suspension method is well described and illustrated. The section on errors and difficulties in the practice of the direct method will be found most useful (p. 486), as also the one on autoscopes in children (p. 488). Tuberculosis of the larynx receives full notice, and stress is laid on the improvement in the prognosis within the later decennia as the result of advances in treatment. Much good is attributed to Grünwald's deep galvano-caustic punctures. Among the minor practical points in the diagnosis of laryngeal paralysis may be noted (p. 580) the apparent asymmetries produced by tilting of the throat mirror to one side or the other. The author advises checking by means of the direct method. We would add the advisability of holding the mirror with each hand alternately, and have been struck by the varying reports of observers according as they held the mirror in the right or the left hand. A good description is given of Brünings' method of injecting a completely paralysed cord with paraffin, so as to bring its edge nearer the sound cord (p. 582). The comparatively small number of pages devoted to tracheo-bronchoscopy contain practically all that the reader can wish to know, and such a condensed account from the pen of one of the highest authorities on the subject is invaluable. He deals with the matter in a large-minded way, and, though *par excellence* a specialist in tracheo-bronchoscopy, he does not hesitate to say that indirect tracheoscopy should be more studied than is at present done, so as to avoid the introduction of a tube in cases of simple stenosis (p. 593). He, therefore, gives very explicit directions for its performance. It need hardly be said that in the description of bronchoscopy Prof. Brünings is perhaps at his very best, and in a comparatively small amount of space a clear and authoritative description of the use of the endoscope in various bronchial diseases will be found.

The whole work is of such exceptional merit that it is to be hoped that a good translator will soon be found to turn it into English for the benefit of those who are unable to read it in the original.

Dundas Grant.

NOTA SUBSCRIPTA.

His numerous friends will regret to learn that Dr. W. Milligan's indisposition, which appeared just before the International Congress meeting and prevented him attending, has proved to be due to appendicitis. All will hope that he will soon be completely restored to health.

THE

JOURNAL OF LARYNGOLOGY.
RHINOLOGY AND OTOTOLOGY.

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FIFTEENTH INTERNATIONAL CONGRESS OF MEDICINE,
LONDON.

SECTION XV.—RHINOLOGY AND LARYNGOLOGY.

Introductory Remarks by the President, SIR STCLAIR THOMSON.

THE last time that the International Congress of Medicine was held in London was in 1881, when, as a student, I attended some of the meetings. Although there were separate sections for otology, ophthalmology, dermatology and odontology, yet thirty-two years ago our special department of practice had not attained to a separate, autonomous section. Rhinology was hardly recognised, and laryngology was relegated to a sub-section and had no president. The sittings were presided over by a chairman selected from the vice-presidents of the Section of Medicine. That chairman was Sir George Johnson, my own chief, who, however, desired to be known as a general physician, although his observations on the innervation of the larynx are worthy of remembrance. The number of laryngologists who inscribed their names as members of this sub-section, this Cinderella of the specialities, was 342, and the average daily attendance at the sittings varied from 60 to 100. To-day already 230 have inscribed their names, and judging from this morning's gathering our attendance will be numbered in hundreds.

In the year 1881 eighteen hours were given up to discussing thirty-eight papers. This year we are prepared to devote thirty hours to debating five rapports and thirty-four communications.

The chairman of 1881 has been gathered to his forefathers, but all the three secretaries of that occasion are, I rejoice to say, still amongst us and in the full enjoyment of health and vigour. Dr. de Havilland Hall has been lured into the wider field of internal medicine; Dr. T. J. Walker in the provincial town of Peterborough, where I commenced my studies of medicine as his pupil, has won renown as a general surgeon; but Sir Felix Semon has continued to be the devoted apostle of laryngology, and in his retirement from active practice he remains an attached follower and a detached critic.

It might be interesting if I briefly referred to the subjects of discussion in 1881 and left to all present to draw their own comparisons with the programme of work we have before us to-day, in this way showing how swift and mighty has been the progress of rhino-laryngology in these thirty-two years.

The chairman, in his opening address in 1881, still felt it necessary to uphold the claims and benefits of the laryngoscope, and Manuel Garcia again narrated how the possibility of viewing the living larynx flashed across his imagination while he was strolling in the garden of the Palais Royal that historical September day in 1854. The local treatment of diphtheria nowadays, thanks to the wonderful discovery of antitoxin, of such secondary, I might almost say, of such trifling importance, was one of the subjects of set discussion, and the rapporteurs were Morell Mackenzie, Tobold, and Lennox Brown. Krishaber, of Paris, announced his firm conviction that tuberculosis of the larynx, while possibly healing in one part, yet always broke out in another, and so invariably ended fatally, generally within a year, although "*quelques cas resistant deux ans.*"

A debate on laryngeal paralyses set the foundation of our now established classification of these affections and gave the early embodiment of what we know as the Semon law. It gives us pause to read that a subject of debate was "the indications for extra-or intra-laryngeal treatment of benign tumours of the larynx," when at present all the world knows that every simple growth can be removed by the intra-laryngeal route according to the Hippocratic principle, "*cito, tutto et jucunde.*" But doubtless the subject was chosen to enlighten the medical public as to the possibilities of the laryngoscope, which was then only twenty-five years old.

Stenoses of the larynx, still in our day a *bête noir* to the laryngologist, was another subject of general discussion in 1881 one of the rapporteurs being our *confrère*, Heryng, of Warsaw.

The indications for partial or complete extirpation of the larynx were discussed, but laryngo-fissure was not even mentioned during the debate. At that date and for some years afterwards the operation was so disastrous that there was little anticipation of the brilliant results we now obtain.

At our previous London Congress the galvano-cantery had hardly started on its useful, although sometimes wild career, yet in a discussion introduced by Voltolini, Solis-Cohen Cadier, Lennox Brown, Foulis and Victor Lange, one conclusion arrived at, even thirty-two years ago, was that the electric cantery was often used unnecessarily.

Adenoid vegetations were discussed in a masterly way by their discoverer, Wilhelm Meyer, followed by Loewenberg, Guye, and Woakes.

The everlasting subject of ozæna came in for consideration, and five other communications on various subjects completed the programme.

It is interesting to note that in 1881 there was not a single communication on the surgery of the nose, on diseases of the accessory sinuses, on the bacteriology of the air-passages, or on laryngo-fissures. At that date cocaine was unknown, adrenalin was undreamt of, and electricity was not available for illumination.

The trachea was only partly visible when reflected in the laryngeal mirror; but the hardihood of the early pioneers of rhino-laryngology is shown by the record that Morell Mackenzie and Stoerk showed their œsophagoscopes, and the former even exhibited a patient on whom he had performed internal œsophagotomy.

Gentlemen, in the thirty-two years which have passed since an International Congress of Medicine was held in this City, rhinology has been created and laryngology has travelled far.

A glance at our programme will show that diseases of the larynx can now be viewed not only indirectly but directly, and can be surgically attacked both from the outside and through the mouth. The laryngologist has extended his province downwards until it embraces the lower air-passages and even the secondary bronchi, and we are now busy annexing the œsophagus.

Upwards the laryngologist has claimed and explored the nose and its various accessory sinuses. The sphenoidal sinus, a cavity

which not so long ago was looked upon as for ever beyond the surgeon's interference, is now treated daily in every throat clinic, and before our Congress closes we shall, I hope, have shown how it can be traversed to remove disease within the very cranium itself.

Lermoyez divided the history of laryngology into three stages. The first was from the invention of the laryngoscope in 1854 up to the discovery of cocaine. This drug opened up a large field for observation and usefulness and started us on the second stage. The third stage was opened by the perfection of all the endoscopic methods for which we are indebted to Killian and his pupils and followers. Gentlemen, we are happy to have lived in these vigorous years of development of rhino-laryngology. Our speciality in the last ten years has made more marked progress than any of its fellows, and the public hardly realise the benefits it confers on the health and happiness of the community, and particularly of the rising generation.

What will mark the next stage of our progress I will not venture to predict. It only remains for me as spokesman of the Council of the Section and on behalf of all British laryngologists to bid you one and all a hearty welcome, and to assure you, in the words of Shakespeare, that "our true intent is all for your delight."

DIRECT EXAMINATION OF THE EUSTACHIAN TUBE AND NASO-PHARYNX.

BY J. WALKER WOOD.

In the following paper an attempt has been made to analyse the naso-pharyngeal findings in 650 cases—mostly aural. Both Eustachian tubes in each case have been examined separately by the aid of a Holmes's naso-pharyngoscope (Zeiss pattern), supplemented in many instances with the post-nasal mirror, the Eustachian catheter, Eustachian bougie, and the finger. As the majority of the cases have been examined on frequent successive occasions the total number of examinations is a large one. Comparisons of the conditions found in the naso-pharynx and the ear have also been studied, and in many cases the effect of direct treatment of the naso-pharynx and Eustachian tubes has been carefully watched and recorded. It was my desire to tabulate and classify the varied but

associated pathological conditions of the naso-pharynx and the ear, but this was found to be too great a task to complete.

The paper is divided into six different sections:

- (1) Deformities and abnormalities of the mouth of the tube.
- (2) Injuries, paralysis and foreign bodies.
- (3) Inflammatory conditions. Acute: (a) Acute simple salpingitis; (b) subacute salpingitis; (c) acute œdematous salpingitis. Chronic: (a) Simple chronic salpingitis; (b) chronic hypertrophic salpingitis; (c) chronic atrophic salpingitis; (d) chronic granular salpingitis.
- (4) New growths: (a) Simple; (b) malignant.
- (5) Adenoids.
- (6) Various conditions. Varicose veins.

Diseases of the naso-pharynx have long been recognised as a cause of deafness and ear troubles, though I think few of us realise



FIG. 1.



FIG. 2.



FIG. 3.

FIG. 1.—Normal Eustachian orifice. Right.

FIG. 2.—Normal Eustachian orifice. Right.

FIG. 3.—Hypertrophic salpingitis. Right. Note enlargement of posterior lip and narrowing of Rosenmüller's fossa.

how much we owe to Czermak (1), who devised and described an instrument for the examination of the post-nasal space. This primitive instrument is practically the principle of the modern naso-pharyngoscope. Czermak thus describes his invention in a pamphlet on "The Laryngoscope and its Employment in Physiology and Medicine": "It is a metallic tube, bent at a right angle, and therefore composed of two arms, of which one is long, whilst the other—the vertical—is short; an oval steel mirror is attached at an angle of forty-five degrees at the bent part, between the two arms. The light enters through the long arm; the short arm is obliquely cut at its extremity to be introduced behind the velum into the pharyngo-nasal cavity."

Further, in an appendix to the above pamphlet on rhinoscopy, Czermak describes four cases of deafness due to abnormal naso-pharyngeal conditions and tumours.

Abnormalities, 40.

Asymmetry of tube 3; bi-lobed posterior lip 12; supernumerary folds 3; deformed Eustachian ostium 15; bifid posterior lip 6; adventitious openings 3.

Complete absence of the Eustachian tube is very rare, as is also total permanent closure. A case in which there was total absence of the tube, cartilaginous and bony, has been recorded by Fagge (2).

Cases of total permanent closure are usually due to syphilis, although I have had one case under my care where total closure was most probably developmental. Brief notes of this case are appended:

H. J. E—, aged thirty-five. Deaf in right ear from childhood. Membrana tympani indrawn, fixed, adherent. Tinnitus constant, low-pitched. Deafness obstructive. Naso-pharyngoscope: Mouth of tube, lips and fossa are all much reduced in size as compared with the left one. Movements impaired. Catheter: No air can be forced into ear. Bougie arrested by hard blockage at the isthmus. No history of acquired or congenital syphilis.



FIG. 4.



FIG. 5.



FIG. 6.

FIG. 4.—Granular salpingitis. Left. Bi-lobed posterior lip. Adenoid remains.

FIG. 5.—Extreme hypertrophy of the posterior lip. Left.

FIG. 6.—Atrophy of the posterior lip with hypertrophy of the anterior. Left.

Cases of total closure due to syphilis have, however, been reported by Grueber, Lindenbaum and Dennert.

Paterson (3) has recorded an interesting case of deafness due to complete occlusion of the Eustachian tubes by scar-tissue (specific).

Female, aged twenty-one. Congenital specific disease destroying soft palate, part of the hard palate and ulceration of the posterior and lateral walls of the pharynx. Under treatment the parts healed, but coincident with the completion of healing, deafness commenced. Deafness obstructive in type. Membranes flaccid. No appearance of Eustachian tubes.

Injuries and Foreign Bodies, 3.

From the position of the mouth of the Eustachian tube it is obvious that direct injury must be rare. Most frequently injury takes place during the removal of adenoids and naso-pharyngeal

growths. I have seen two such cases and have observed the effect of injury in one other case. Milligan (4) mentions the fact that the Eustachian cushion may be amputated without any bad result. Thomson also says: "I have known of three instances in which the cartilaginous tube was detached, in one case with the forceps and in the others with the curette. There was not the slightest ear complication in any case."

Foreign bodies are also rare. Milligan (5) mentions a case in which a marble became wedged in the naso-pharynx and caused ulceration, sloughing, and ultimate cicatrization of the mouth of the tube. Unfortunately he does not say what was the immediate and ultimate effect, if any, on the hearing. Yearsley (6) relates a case of sudden and severe pain in an ear due to a gooseberry thorn in Rosenmüller's fossa. On the continent several cases of foreign



FIG. 7.



FIG. 8.



FIG. 9.

FIG. 7.—Atrophic salpingitis. Left. FIG. 8.—Varicose veins. Right.
FIG. 9.—Firm band in Rosenmüller's fossa, with adenoid granules in upper part of the recess. Hypertrophy of the posterior lip. Enlarged posterior end inferior turbinal with enlarged vein.

bodies in the tube have been recorded which I will just mention: barley-corn (Fleischmann) (7), raven's feather (Heckseher), worm (*Ascaris lumbricoides*) (Andry and Reynolds) (9), panicle of corn (Urbantschitsch) (10), needle (Albers) (11).

An interesting case has been recorded by Syme (12) in which the pharyngeal portion of the Eustachian tube was injured by operative procedures upon the nose. The Eustachian cartilage (cushion) was torn from its position and ultimately came to lie above the level of the soft palate, being drawn into this position by the action of the levator palati muscle. There was also marked Eustachian obstruction. Before the operation on the nose the hearing was normal, but as a result of it an adhesive inflammatory condition was set up in the middle ear with disastrous effects on the hearing.

Inflammatory Conditions, 456.

In considering the disorders of the Eustachian tube the inflammatory ones bulk very largely in a series of unselected cases. For this reason, therefore, I deal with the chronic inflammatory conditions first. From this investigation I have satisfied myself that a chronically inflamed Eustachian tube is never associated with normal hearing.

A. Chronic: (1) Simple chronic salpingitis, 252; (2) hypertrophic salpingitis, 33; (3) atrophic salpingitis, 84; (4) Granular salpingitis, 30.

B. Acute: Simple acute salpingitis, 57.

(1) *Simple Chronic Salpingitis*.—Normally, the anterior lip is much paler in colour than the posterior, but in chronic inflammation both lips are red, the vestibule is swollen, and the triangular



FIG. 10.

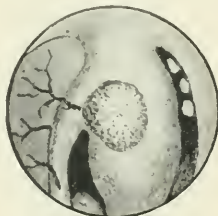


FIG. 11.

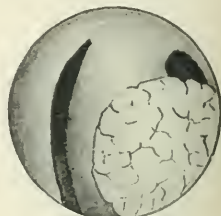


FIG. 12.

FIG. 10.—Mucous polypus in the mouth of the tube. Right.

FIG. 11.—Fibroma of cushion. Adenoid granules in Rosenmüller's fossa. Note enlarged veins. Right.

FIG. 12.—Post-nasal polypus.

surface enclosed by it is reduced in size; the mouth of the tube becomes slit-like. There are often strings of mucus stretching across it. The mucous membrane may be red, dry and glazed, or soft, boggy and moist; moist usually in the early stages, dry in the later. On catheterisation air will be found to pass with difficulty. Complete Eustachian obstruction is rare, although this depends to a large extent on the size of the tube. It is obvious that simple swelling of a large patent tube will not close the lumen so much as in an anatomically narrow one. In only 0.5 per cent. of cases have I found complete Eustachian obstruction. The drum-head shows either active catarrh or sclerosing changes; one rarely finds atrophy with active catarrh.

The chronically inflamed tube may remain in this condition or pass into the second or hypertrophic stage.

(2) *Hypertrophic Salpingitis*.—The hypertrophy usually involves

the posterior lip or the floor of the vestibule. It is rare to find the anterior lip hypertrophied although I have done so in some cases. In several of my cases the hypertrophy of the cushion has been so extreme as to completely block the mouth of the tube, and would have effectually prevented the introduction of a catheter. The hypertrophy is one of sub-epithelial fibrous tissue; when felt with the probe it is found to be firm, and the application of cocaine solution has little effect upon it.

In other cases a condition more of the nature of vaso-motor rhinitis was present in which the swelling of the cushion was due to vascular turgescence, the application of cocaine being followed by marked reduction in the size of the posterior lip.

In one case the hypertrophy was so great as to cause contact between the posterior ends of the inferior turbinates and the posterior lip of the tube, and was associated with no small degree



FIG. 13.



FIG. 14.



FIG. 15.

FIG. 13.—Adenoid remains in Rosenmüller's fossa. Enlarged veins.

FIG. 14.—Bi-lobed posterior lip. Adenoid granules in fossa. Left.

FIG. 15.—Multiple bands extending across Rosenmüller's fossa. These are probably the result of untreated adenoids. Note granules in the interstices of the bands.

of nasal obstruction. With astringent applications the hypertrophy was reduced to one quarter the size. This was attended by a great improvement in the hearing, and relief of the nasal obstruction. As might be expected Eustachian obstruction was usually present. Generally it was intermittent in character and associated with a constant low-pitched tinnitus. The obstruction may be caused by swollen mucous membrane or by inflammatory interference with the movements of the Eustachian valve.

Rosenmüller's fossa may be completely filled with the swollen lip, and I may say that it is usual in this condition to find a retracted, catarrhal membrana tympani. The resulting deafness is only moderate in amount. Extreme forms of deafness due to chronic middle-ear catarrh are rarely found with an hypertrophied posterior lip.

(3) *Atrophic Salpingitis*.—The terminal stage of chronic inflammation, and one in which we usually find atrophy and anaemia of the mucous membranes of the mouth of the tube, the tympanum, and frequently of the nose and pharynx.

The mouth of the tube is patulous, the anterior lip sharp and prominent, the posterior lip reduced in size, the whole anæmic and lifeless-looking. The area of the vestibule is larger than normal. Inflation is easily carried out by Valsalva's method. Abnormal patency of the tube gives rise to that interesting condition known as "autophonia," which has been defined as "a very much augmented loudness of the speaker's own voice, the sounds entering the ear with such intensity that pain is caused" (Rudinger). Holmes is of the opinion that true atrophy of the mucous membrane of the tube is rare.



FIG. 16.



FIG. 17.

FIG 16.—Post-nasal polypi.

FIG. 17.—Hypertrophy of the mucous membrane of the vault and posterior pharyngeal wall. This is usually observed in long-standing cases of post-nasal catarrh. Note also the granular condition of the mouth of the tube and the enlarged vein.

The tympanic membrane may be adherent, or loose and atrophic, or adherent in one part and atrophic in another. There is always a high degree of deafness. Treatment is usually ineffective.

(4) *Granular Salpingitis*.—This form usually comes before the hypertrophic and is found in the early stages of middle-ear catarrh in young people, and associated with adenoids. The posterior lip and vestibule are the parts usually affected. The surfaces are finely granular, moist and red, suggesting somewhat Morocco leather. It is accompanied by only slight deafness.

(5) *Acute Salpingitis*.—This is, perhaps, the most important condition affecting the Eustachian tube, as its resulting effects are so grave. All cases of middle-ear catarrh are due, in the beginning, to catarrhal conditions affecting the naso-pharynx, the mouth of the Eustachian tube and the tube itself. Obstruction of the

tube occurs and in-drawing of the tympanic membrane, which may become adherent to the inner tympanic wall; even supposing it does not, exudation may take place and fibrous bands form. I have carefully inquired into many hundreds of cases of chronic middle-ear catarrh, and in a very large proportion I have found that these patients suffered from attacks of ear-pain or earache in childhood. These were attacks of acute or subacute middle-ear catarrh and salpingitis resulting from adenoids, bad teeth or chronically inflamed tonsils.

An acute inflammation having developed, what are its symptoms?

(1) Pain, usually referred to the neck, may be radiating to the ear; almost always earache.

(2) Deafness, obstructive in character, varying with the amount of Eustachian obstruction; stuffiness in the ear.

(3) Tinnitus, low-pitched in character, humming, "popping" noises, indicating sudden relief from the obstruction and the entry of air into the middle ear.

(4) Drum injected and red. Some drums are abnormally thin and transparent (not atrophic); in these cases the inflamed lining membrane of the middle ear may shine through and give the appearance of an inflamed red drum. There is this distinguishing feature—that in an inflamed drum the malleus and blood-vessels running along it are engorged, while in the thin drum the malleus stands out white on a red ground with no engorgement of vessels. The latter is really an earlier condition of the former.

(5) Mouth of the Eustachian tube is red, glazed and swollen. There may be a slight mucous exudate in the mouth. The swelling is confined to the mouth and the tissues immediately around the mouth, and is not a general inflammation as in chronic salpingitis. A further distinguishing feature between acute and chronic inflammation of the mouth is this—in acute inflammatory conditions the minute vessels normally seen radiating about the tube are completely obscured, while in the chronic inflammatory conditions the vessels are well defined and often engorged.

In several cases I have observed a fine film of exudate about the mouth of the tube, and in one case I have seen a granulation form in the vestibule. Movements of the mouth of the tube are often impeded. Rosenmüller's fossa shares in the inflammation, as also do the posterior ends of the turbinates and posterior pharyngeal wall. There is more or less complete Eustachian obstruction. The obstruction may be at the mouth of the tube when it is due to

viscid inspissated secretion; more often the obstruction takes place at the isthmus, where, it may be remembered, there is a collection of glands known as the "tonsil of the tube" (Gerlach). Politzerisation and inflation after the method of Valsalva fail to overcome the obstruction, and even with the aid of the Eustachian catheter air is only forced into the ear with difficulty.

The conditions thus described may then follow one of three courses: (1) It may subside completely, to be followed at intervals with other attacks of varying severity. (2) It may remain in a state of subacute inflammation for some time, and it is this condition which is responsible for the formation of bands and adhesions about the mouth of the tube and in Rosenmüller's fossa. (3) It may become chronic, hypertrophic, or atrophic.

New Growths (Malignant).

Malignant disease of the mouth of the Eustachian tube is probably much more common than is supposed. In all cases of slight deafness it is of the greatest importance to always make a careful examination of the post-nasal space with the naso-pharyngoscope, as by its use an easy, accurate and precise examination of that region can be made. The difficulties which we have all experienced in the use of the post-nasal mirror, no matter how expert we may be in its use, and the frequent failure to obtain a satisfactory view of the Eustachian tubes, are a sufficient justification for the insistence of the routine use of the naso-pharyngoscope in all aural cases. In addition, this instrument enables us to view the removal of a portion of the growth for microscopic examination, the cutting instrument and the growth being under the direct observation and control of the surgeon. The clinical picture presented by malignant disease is more or less a constant one. The signs and symptoms are:

(1) Deafness, not usually extreme, but more characteristic of Eustachian obstruction than middle-ear disease. Membrane is usually retracted; obstruction found with catheter.

(2) Pain, typical severe trigeminal pain commencing in the third division of the fifth nerve, passing to the second and rarely involving the first.

(3) Abnormal condition of the palate, swelling or paresis. The immobility of the palate is said to be due to the interference with the levator palati muscle.

(4) Nasal obstruction—a much later sign, and by no means a constant one.

An explanation of the constancy of the clinical picture of malignant disease in this region is readily understood when the anatomical fact is remembered that the Eustachian tube, the inferior division of the fifth nerve and the levator palati muscle are all within three quarters of an inch of each other.

The two following cases reported by Drs. Law and Abbott are most instructive.

Dr. Law's Case (18).—Male, aged thirty-seven. February 18, 1904.—Deafness in right ear, three months' duration. Symptoms of Eustachian obstruction.

March 8.—Severe pain in right ear.

May 13.—Severe pain referred to second and third divisions fifth nerve. Bleeding from right nostril. Glands in right side of neck. Palate drawn to the right side. A soft swelling felt in region of right Eustachian tube.

June 4.—Operation. Osteo-plastic resection of the superior maxilla (Wilfrid Trotter). Tumour found to be growing from the wall of the post-nasal space between the lateral recess and the Eustachian tube. Tube blocked. Growth removed.

July 2.—Glands removed. Pain continues; deafness stationary; membrane more in-drawn.

January, 1910.—Severe pain continuing.

August.—Alcohol injections second and third division of fifth nerve; no relief.

September.—Infra-orbital nerve removed. Pain continues.

October.—Gasserian ganglion explored and found to be involved in the growth. Ganglion and growth removed. Relief to pain.

Previous to operation a diagnosis of epithelioma was made by Dr. Law; this was confirmed by pathological examination of the growth after removal.

Dr. Abbott's Case (19).—W. M—, aged nineteen. Deaf in right ear for three months. Difficulty in opening mouth. Pain right side of neck. Eustachian obstruction and retraction of drum membrane. Bulging and immobility of right side of soft palate. On examination a smooth elastic half-ovoid growth was found in the naso-pharynx in the position of the Eustachian tube. A diagnosis made of periosteal or perichondrial sarcoma of the Eustachian tube.

Recently (JOURN. OF LARYNGOL., RHINOL., AND OTOL., May, 1913) another case of carcinoma of the mouth of the Eustachian tube has been reported by Norman Paterson, in which a firm fibrous growth the size of a walnut was removed from the left Eustachian-tube region. A pathological report stated it to be a squamous and polygonal-celled carcinoma.

Benign Growths, 4.

Simple or benign growths, whether of the mouth of the tube, the tube itself or its boundaries, are all of rare occurrence. Undoubtedly in the past many small growths of this hitherto "out-of-the-way" region of our speciality may have been missed in post-rhinoscopic or digital examinations.

Possibly as the naso-pharyngoscope comes into more general

use in oto-rhinology, the number of new growths occurring in this region will be found to be greater than supposed.

Etiology.—Out of the 650 cases recorded here, simple benign growths were only found in four, all being women. Age commonest between twenty and forty.

From recent records I have obtained notes on three other cases—sex, two men, one woman.

Ear Condition.—In two cases there was advanced chronic dry catarrh of the middle ear. In one case tinnitus only was complained of with slight obstructive deafness, both of which were relieved by operation (*i.e.* removal of growth). In one case a growth of the cushion, unattended by any ear symptoms, was found while carrying out the routine examination of the naso-pharynx.

Holmes (13) states that growths in Rosenmüller's fossa and about the cushion of the tube are common, while in the tube itself growths are rare. Out of the large number of cases examined by him a growth in the tube itself has only been found twice.

In an earlier article (14), Holmes relates one case in which he removed a polypoid growth nearly as large as an orange-seed, which was attached to the floor of the tube. It was so far within the tube that he could only see it by the aid of the naso-pharyngoscope.

Cases.

(1) *Mucous Polypus* (15).—Male, aged forty-five. Deaf ten years. Right ear first, left later. No discharge. Paracusis present. Deafness obstructive. Right drum retracted. Left drum retracted and opaque. Malleus fixed. Diagnosis—chronic middle-ear catarrh.

Naso-pharynx: Presenting at orifice of left Eustachian tube is seen a round, smooth, greyish-blue tumour, the size of a large cherry-stone, filling lumen of orifice and slightly bulging the lateral pharyngeal wall. Growth under observation two years, remaining stationary. Hearing varies.

(2) *Cartilaginous and Fibrous Growth* (16).—Girl, aged eighteen. The site of origin was apparently the left Eustachian cushion, or the area between the latter and the upper end of the adjacent posterior pillar. It occupied the greater part of the naso-pharynx.

(3) *Mucous Polypus* (17).—N. B——, motorman, aged fifty-six, came to me first on November 23, 1910, complaining of increasing deafness and crackling in the left ear for the past three weeks. Drum retracted. Deafness with forks obstructive. Post-nasal, polyp size of swollen rice-granule was found to be filling the pharyngeal orifice of the left tube. It was attached to the anterior superior border of the tube, and was removed under cocaine by means of a snare introduced through the inferior meatus of this side, the wire being placed about the polypus by observing through a Hay's pharyngoscope.

(4) *Fibroma* (J.W.W.).—Miss C——, aged thirty-five (No. 108). Nasal obstruction due to hypertrophic rhinitis of inferior turbinals. Ears normal.

Naso-pharynx: Edema of posterior edge of the septum. Enlarged posterior ends in contact with anterior lip of the tube. Large plexus of veins on anterior surface. Attached to the apex of the posterior lip (cushion) of the tube is a firm, fibrous growth, dark red in colour, distinguishing it from the rest of the Eustachian orifice. Growth not removed: diagnosis probably fibroma.

(5) *Mucous Polypus* (J.W.W.).—Mrs. B—, aged forty (No. 172). Complains of popping tinnitus in right ear and intermittent deafness, slight in amount. In addition has constant low-pitched tinnitus. Drum in-drawn and catarrhal. Slight obstructive deafness.

Naso-pharynx: Whole mouth of tube congested and inflamed. Lips separated by a polypoid-like growth extruding from the mouth of the tube by a narrow pedicle. The growth is like an ordinary nasal polypus in appearance and in size equal to a small orange-pip; it is freely movable, and was easily removed by the aid of my Eustachian forceps. Pathological report states it "to have all the characteristics of a mucous polypus."

(6) *Localised Hypertrophy (Fibroma)* (J.W.W.).—Miss W—, aged twenty-eight (No. 253). Chronic catarrh of the middle ear. Sclerosis of both drums. Malleus fixed. Constant tinnitus (low-pitched) several years' duration.

Naso-pharynx: Attached to the anterior lip of the right Eustachian tube is a small round reddish growth. Varicose veins around it. Both lips of the tube swollen and inflamed. Growth removed with Eustachian forceps. Pathological report (Dr. Wingrave): "The growth consists mainly of white fibrous elements with patches of glands (acino-tubular) slightly degenerated. There are also some distended lymph- and blood-spaces. It may be interpreted as a localised hypertrophy of normal tissues."

Following removal there was a complete cessation of the tinnitus and a marked improvement in the hearing. The lady remarked also that she had lost the "stuffy feeling" in the ear.

(7) *Mucous Polypus* (J.W.W.).—Miss F—, aged twenty-five (No. 135). Chronic middle-ear catarrh. Drums movable, right slightly retracted. Chronic rhinitis and post-nasal catarrh.

Naso-pharynx. Chronic salpingitis (moist). Both tubes. Some small varicose veins. Movements of both tubes sluggish. In the mouth of the right tube is a very small polypus-like growth not much larger than a small rice-granule. Removal not attempted at present (April, 1913).¹

Adenoids, 234.

- (1) Adenoid masses—central and lateral, 63.
- (2) Adenoid remains, 75.
- (3) Adenoid granules, 96.

¹ Note.—This growth was removed by me in September, 1913. The pathological report (Dr. Russ) is as follows: "Sections from this tumour show a loose connective tissue universally infiltrated with small round-cells, chiefly leucocytes, of which many are in various stages of degeneration. Plasma-cells, fibroblasts and lymphocytes are also present. The vessels are fairly well formed, dilated, and many of them contain leucocytes. No surface epithelium appears in sections. The histological features are those of a chronic inflammatory process, and there is nothing to indicate a tubercular lesion, nor is there any evidence of malignant disease." There has been a marked improvement in this patient's hearing following removal of growth.—J. W. W.

(1) *Adenoid Masses, Central.*—The comparative smallness of the number is accounted for by the fact that very few children were examined, but practically in all who were examined an adenoid mass was found. Central adenoids are those attached to the vault of the nasopharynx and are the commonest. Although causing nasal obstruction they do not often cause Eustachian obstruction, but by their presence may cause Eustachian inflammation and catarrh; as an influencing factor in this connection it is to be remembered that the Eustachian tube in children is shorter, more open and more horizontal than in the adult. Laubi (21), who examined 22,894 children with and without aural defects, found tubal trouble in 51.1 per cent.

From the observation of my own cases I conclude that it is very rare for a central adenoid mass to encroach upon the Eustachian ostium and block it. It may irritate, but it does not block the tube.

Lateral Masses.—It is sometimes observed that the centre of the post-nasal space is clear, while the sides of the naso-pharynx, specially in the region of Rosenmüller's fossa, are filled with masses of adenoid vegetations. They may even be attached to the posterior lip of the tube and fill the mouth of the tube. This form, while not so frequent as the central, is a much more serious condition so far as the ears are concerned. Salpingitis and otitis media frequently occur, and I consider that lateral or recessal adenoids are the principal ætiological factors in producing chronic dry catarrh of the middle ear. The frequency with which adenoid remains and granules are found in Rosenmüller's fossa in cases of old chronic middle-ear catarrh is, I think, a proof of this. It is interesting in this connection to refer to an article by F. P. Emerson in the *Annals of Otology* (20), written long before the advent of the naso-pharyngoscope. Emerson records nine cases in which adenoid remains and granules were found in Rosenmüller's fossa; seven of these cases had tinnitus and were deaf from chronic catarrh of the middle ear. In all the lateral fossæ were cleared and all were benefited by it.

(2) *Adenoid Remains.*—Adenoid remains are frequently seen in the naso-pharynx. The areas in which they are found are, as would be expected, the vault of the naso-pharynx and the lateral recesses (Rosenmüller's fossa). On the vault they are represented by a symmetrical wrinkling of the mucous membrane suggesting the heraldic Prince of Wales's feathers; they are usually red in colour and should not be confused with the thick, smooth, velvety crimson patch usually found in post-nasal catarrhs.

In Rosenmüller's fossa adenoid remains occur more often than on the vault. Their appearance is varied. (1) The whole recess may be filled with firm, finger-like masses of adenoid tissue. (2) The adenoid masses may be in discrete, rounded, soft granular masses secreting a viscid mucus which may surround them. (3) There may be one or more strong fibrous bands extending across the upper part of the fossa from the posterior lip to the lateral pharyngeal wall. Some adenoid granules are usually seen in the recesses between the bands. I consider these bands are the remains of adenoids which have undergone fibroid change and physiological atrophy. They are to be distinguished from the more delicate bands associated with chronic inflammation of the tubal orifice, which are usually single, much more delicate, and may extend in all directions. The association of adenoid remains with chronic catarrh of the middle ear I have already pointed out, but in this connection I may mention that I took a hundred successive cases of chronic dry catarrh and found either bands, adenoid remains or granules in 10 per cent. of them.

Varicose Veins, 198.

After examining a large number of Eustachian orifices one comes to recognise as being normal two small veins passing from the posterior choana over the anterior surface of the anterior lip of the tube to end in the posterior surface just at the point where the lip passes out of the field of view of the naso-pharyngoscope. It is difficult to gauge their size, but I should say they were about 1 line in width. Frequently these vessels are dilated, irregular, knotted and winding—in other words, varicose. They are common in all forms of ear disease, in chronic salpingitis, and are most frequently associated with some abnormal condition of the posterior nares, which may be hypertrophy of the turbinals, mulberry posterior ends, polypoid degeneration. When these veins are very large it is often noticeable that there is a fine plexus of veins surrounding the mouth of the tube. In size these varicose veins may be as much as 1 mm. in width. The termination is abrupt, often ending in a small globule about the size of a pin's head. These veins communicate with those of the tympanic cavity by means of a plexus of veins surrounding the whole length of the Eustachian tube. Anastomosing branches with the cavernous sinns are also found.

Any local condition, therefore, interfering with the return of blood, may cause engorgement and swelling of the Eustachian tube

and ultimately of the tympanic cavity, a condition of hydrops *ex vacuo* being readily produced.

REFERENCES.

- (1) "The Laryngoscope and its Employment in Physiology and Medicine," Dr. J. N. Czermak, 1858-1859. New Sydenham Society, 1861.
- (2) *Trans. Otol. Soc.*, vol. v, p. 20, 1904.
- (3) D. R. PATERSON.—*Proc. Roy. Soc. Med.* (Otol. Sect.), vol. iv, No. 8, June, 1911.
- (4) W. MILLIGAN.—"Discussion on Injuries of the External and Middle ear," *Proc. Roy. Soc. Med.* (Otol. Sect.), vol. iv, No. 6, 1911.
- (5) *Ibid.*
- (6) MACLEOD YEARSLEY.—*Ibid.*
- (7) HARTMANN.—"Diseases of the Ear," 1887, p. 152.
- (8) *Ibid.*
- (9) *Ibid.*
- (10) *Ibid.*
- (11) *Ibid.*
- (12) W. S. SYME.—*Ibid.* (Otol. Sect.), vol. i, No. 8, p. 126, 1908.
- (13) "Examination and Treatment of the Eustachian Tubes by the Aid of the Naso-pharyngoscope," *Annals of Otology*, September, 1911.
- (14) *Ibid.*, March, 1911.
- (15) J. A. JONES.—*Proc. Roy. Soc. Med.* (Otol. Sect.), vol. iii, No. 6, April, 1910.
- (16) A. R. TWEEDY.—*JOURN. OF LARYNGOL., RHINOL., AND OTOL.*, April, 1913, pp. 203-204.
- (17) "Polypus of the Pharyngeal Mouth of the Eustachian Tube," C. M. Brown, *Laryngoscope*, January, 1912.
- (18) E. LAW.—*Proc. Roy. Soc. Med.* (Otol. Sect.), and discussion, vol. iii, No. 5, p. 28, 1910, and vol. iv, No. 5, p. 67, 1911.
- (19) F. C. ABBOTT.—*Trans. Otol. Soc.*, vol. ii, 1901, p. 18.
- (20) *Annals of Otology*, September, 1907, p. 694.
- (21) S. J. KOPETZKY.—*Ibid.*, September, 1907.

A SIMPLE PROTHESIS AFTER REMOVAL OF A GREAT PART OF THE LOWER JAW.

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FOR a long time Mr. E——, steward on a transatlantic steamer, felt something in his mouth, under the tongue. The ship's doctor, consulted upon it, assured him that it was a simple ulcer and prescribed a gargle, advising him not to think too much of it. The patient, however, could not avoid thinking of his complaint now and then, because he felt it, and showed the floor of his mouth several times to the doctor on different voyages. But diagnosis and medications did not change.

As he got pain when swallowing and could not open his mouth as wide as before, he came to me, on March 8, 1911, just going to start for a new voyage.

Beneath the angle of the left lower jaw there was to be seen a tumour, hard to the feel, fixed on the jaw, loose from the skin, not painful on pressure. Glands enlarged only to the left. In the floor of the mouth, under the tongue, I found an uneven surface, ulcerating in the left part. On bimanual exploration the tumour appeared to occupy almost the whole floor of the mouth and to be firmly attached to the left horizontal arch of the jaw at the height of the canine tooth. The corresponding place at the outer

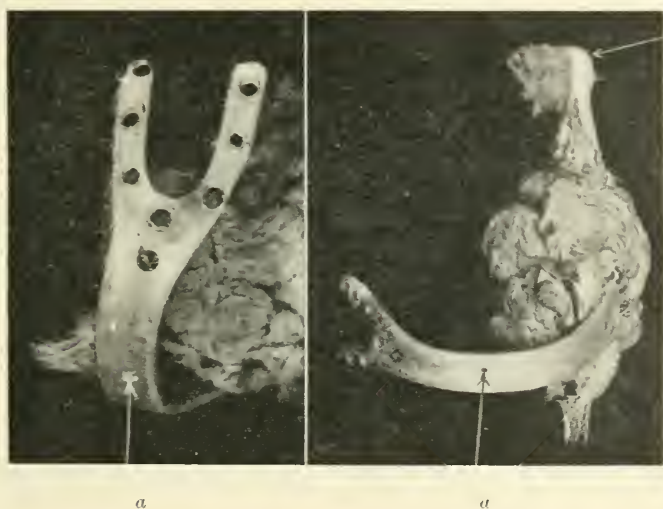


FIG. 1.—Simple aluminium prosthesis for the lower jaw, still fixed to its left vertical branch. *a*. Bore in the middle of the chin-bow. *b*. Processus condyloides.

side of the jaw proved not to be free. The growth extended backwards to the right as far as the canine, being there loose from the bone, and to the left as far as the second premolar. The tongue was partially infiltrated; its point was free, however.

I took some fragments from the ulcerating tissue for microscopical examination and prescribed iodide of potassium, the patient having to sail the next day.

In accordance with the clinical symptoms I could soon make the undoubted microscopical diagnosis of cancer, and convinced the patient at his return of the necessity of undergoing a serious operation. This operation not belonging to the domain of the laryngologist, I begged Dr. MacGillavry to charge himself with it.

Accordingly, on May 19, 1911, the operation took place, under mixed narcosis of chloride of ethyl and chloroform.

Typical incision of Kocher. Under the jaw all the tissue was dissected off and a part of the carotid cleaned. The growth appeared to be firmly adherent to the jaw. Next the lip was split in the middle line. To the right, the periosteum was detached from the bone as far as the first premolar. To the left, the lip was raised and detached as far as the second premolar; periosteum, mucous membrane and infiltrated tissue remaining connected with the bone. Then both the arches of the jaw were sawn off with the Gigli saw, on the left side behind the second premolar, on the right behind the canine tooth. The tumour was hanging now at the tongue alone and was cut off largely within the sound tissue.

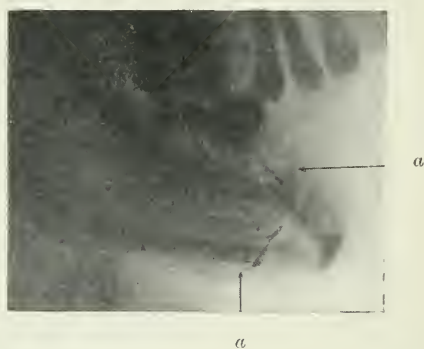


FIG. 2.—Skiagram showing the position of the prothesis after the operation.
a. a. Bronze wire with which the prothesis is fixed to the jaw-stumps. ($\frac{1}{2}$.)

After complete hæmostasis the operator inserted an aluminium prothesis (see Fig. 1), which I had made previously after measuring the jaw and noting the points where the arches were to be sawn off. A prothesis was absolutely necessary, not only because the deformity of the face was excessive without it, but principally because the tongue, losing its attachment to the front part of the jaw, would fall back and cause continual danger of suffocation. Therefore I pierced a hole (a) into the middle of the chin-bow of the prothesis in order to fix the tongue in front. In accordance with the unequal lengths of the remaining jaw-arches, the arches of the prothesis were of corresponding lengths, bearing a U-shaped end, provided with several bores, for the purpose of adapting its length and place to the jaw-stumps. In both of the two stumps two holes were now bored and the prothesis firmly fixed on the outside of

the stumps by means of bronze wire (see Fig. 2, *a*), and in such a position that the chin-bow of the prothesis pointed somewhat downwards, in order to keep the natural contour of the chin as much as possible (see Fig. 2). Next the tongue was strongly fixed with bronze wire passed through the hole in the middle of the prothesis (Fig. 2, *a*), the mucous membrane of the cheek was sutured over the prothesis with that of the tongue, both parts of the lip joined and finally the skin-wound shut, except in the lowest part, for the purpose of drainage. The whole prothesis was covered now by the tissues.

For ten days the patient was fed through a tube. After twenty-four hours he was allowed to get up now and then. The healing of the wound progressed favourably. Only in the posterior part was there a tendency to suppuration, owing to the proximal end of the prothesis becoming visible through the tissues. The patient felt very well, soon learned to swallow, and in some weeks he could speak distinctly enough to converse with persons accustomed to it. Though he could not remain a steward he found an occupation in the office of his company.

After four months and a half, however, recurrence appeared at the left side, round the stump of the jaw. A new operation took place on October 7. The whole prothesis, a part of the tongue and the whole left part of the jaw were radically removed. The right stump of the jaw fortunately kept exactly its position.

Two months and a half passed before there was another recurrence, and on January 4, 1912, it appeared necessary to clean the upper part of the wound and to remove a part of the sterno-mastoid and a piece of the jugular vein.

Two months later the recurrence was more serious, the growth having reached the basis cranii and enveloped the large neck-vessels. All the macroscopically infiltrated tissue was then radically excised. Unfortunately, there was soon a new, this time inoperable recurrence, causing death two months later, just a year after the first operation.

With the conviction that life would have become insupportable shortly after the patient came to me for the first time, on account of the size and localisation of the tumour, close to the large vessels, and the floor of his mouth becoming one large, suppurating surface, we may consider the operation as having surely influenced the general state of the patient favourably and probably lengthened his days.

Considering the operation from this point of view as necessary—

at least desirable—we may state the peremptory necessity to connect both the branches of the lower jaw with a prothesis, permitting to fix the tongue to, and avoiding by the same its falling backwards and causing suffocation. In fact, it has been proved by the case related above that such a simple prothesis which, I think, at least one surgeon in every greater town or medical centre must be able to work himself out of a piece of malleable metal, *e. g.* aluminium, is able (1) to keep the external contour of the chin, especially in male patients, who can let their beards grow, and to learn (2) in a short time swallowing, and (3) speaking distinctly enough for ordinary conversation. Then it is evident that the surgeon, who knows as an anatomist the anatomical conditions much better than any manufacturer of instruments, spends less time in making such kinds of simple protheses within an hour or something more himself, than in giving to a technical mechanic such directions as will do to produce exactly what he wants, ready for use.

PRIMARY INTRA-NASAL SYPHILIS.

By NEIL MACLAY, M.B., C.M.,

Hon. Surgeon, Throat, Nose and Ear Hospital, Newcastle-on-Tyne.

SYPHILITIC manifestations in the nose are commonly of the tertiary type, with an occasional secondary display, and while the primary sore is mentioned by various authors as occurring in the nose, the lesion described is usually vestibular. The under-mentioned case emphasises the fact that the Hunterian sore may be so hidden in the nasal interior, and may be so unlike the ordinary chancre, as to escape detection, and render diagnosis a thing of the very greatest difficulty.

The patient, a male, aged twenty-five, was first seen by me on April 19, last year, when he complained of soreness in the inside of his left nostril and nasal obstruction on the same side. There was no history of any previous nose trouble, and the present discomfort apparently commenced like a cold in the head on or about the 10th of the month, and after a day or two of coryza and stuffiness, something painful and tender made itself evident.

Examination revealed a slight swelling of the left ala nasi extending to the junction of the cartilage and the nasal bone, and involving also the adjacent part of the cheek. There were three or four very hard and enlarged lymph-glands in the left submaxillary triangle, and pain was complained of in this region during the act of deglutition. No morbid change could be seen in the buccal, faucial or pharyngeal mucous membrane, and the right side of the nose internally appeared normal. The left side of the nose was almost completely occluded, and only after

cocaine and adrenalin application and somewhat forcible use of the speculum, an area of intense inflammation, about the size of a threepenny piece, could be seen on the anterior end of the inferior turbinal, and this patch, which appeared circular in outline, was covered by a yellowish-white membranous new formation. Any interference with the fibrinous deposit caused free oozing of blood.

A swab was taken from the infected nostril, and in due course the bacteriologist reported the presence of strepto- and pneumococci in great numbers.

An alkaline lotion and a colloidal silver preparation were used, and five weeks after the onset of symptoms, though the false membrane had vanished and the inflammatory reaction seemed less inside, there was much greater glandular swelling, and the infiltration of the ala became more marked.

The actual sore could not, on account of its situation, be palpated; its centre or base was red and had a soft pulpy appearance, and the circular margin was slightly raised.

Meanwhile constitutional disturbance was marked; lassitude, limpness and pains in the legs, with an entire absence of headache. There was a little pyrexia all the time, and the pulse was accelerated out of proportion to this.

The tentative diagnosis of primary syphilitic infection was confirmed about the end of the sixth week of the illness by the appearance of a typical secondary rash. The Wassermann test was not done.

The patient is a clean, careful man, of good social position, who, in the course of his employment, has been brought into close relationship with a man now known to be suffering from early secondary syphilis, and though the presumption is that the infection was conveyed by the fingers, he would not admit the habit of nose-picking.

BRAIN ABSCESS OF AURAL ORIGIN.

By JOHN MURPHY, M.D., F.R.C.S.I.,

Surgeon to the Ear, Nose and Throat Department, St. Vincent's Hospital,
Melbourne.

ON April 24, 1913, I was asked by Dr. Alex. Lewers, senior physician to St. Vincent's Hospital, to see a patient in his ward who showed signs of intracranial complications of ear disease. The patient, R. B—, aged sixteen, was in bed and complained of headache—frontal and occipital. The headache had started four weeks prior to admission and had been continuous since. Eight days previously he vomited several times and had vomited off and on since.

The patient noticed some dimness of vision, especially in the left eye. Dr. Edward Ryan, oculist, examined the eyes and stated that there was definite left optic neuritis. A week before I saw the patient he stated that he had noticed some weakness of the right hand, and on several occasions after sitting for some time and then getting up he became giddy.

He has had a discharging left ear for four years. There is no alteration of his speech and very little alteration in the reflexes on either side.

The patient was quite clear mentally. On examining the left ear I found that the meatus contained pus, and through the upper part of the tympanic membrane there protruded a polypoid mass of granulation-tissue. Functional testing indicated a normal internal ear but a pathological middle ear, the hearing being reduced to one eighth normal, *i. e.* air-conduction.

There was also evidence of left Eustachian tube obstruction. There was no tenderness over the mastoid or on percussion over the region of the temporo-sphenoidal lobe or cerebellum on the left side. The temperature was normal. Pulse 60 to 76. On sitting him up for rotation to see the direction of nystagmus he became giddy and sick so I desisted. I decided to operate at once. I first did a radical mastoid operation: the mastoid cells and antrum contained pus. I then with a gonge removed the tegmen tympani and adjacent bone for about three quarters of an inch, thus exposing the dura mater over the region of the middle ear and mastoid cells. I incised the dura and passed a narrow-bladed scalpel upwards and forwards into the temporo-sphenoidal lobe of the brain, then withdrew it: no pus. I inserted it again for three quarters of an inch vertically upwards: again no pus. After withdrawing it I re-inserted it for three quarters of an inch upwards and backwards, but again no pus was seen. I then placed a drain tube near the wound in the dura and brought it out at the lower end of the mastoid wound as a drain. I then sutured up.

For some days after the operation the headache was less, but after about a week it became fairly severe, and as days went on increasing in severity. All this time his temperature and pulse were normal and he was quite clear-headed.

On May 6, 1913, the headache was very severe and there appeared some right facial paralysis. Next morning he was complaining of headache and was not so clear mentally. The facial paralysis had increased; there was some weakness of the right hand, but the reflexes were much the same on both sides. I was convinced that he must have an abscess, so I again advised operation and with much reluctance his parents gave their consent. He was taken to the operating room and Dr. Doyle had given him a little ether when the patient stopped breathing. Artificial respiration was resorted to and kept up for two or three minutes and then stopped for some seconds, but the patient would not breathe. His

pulse was all the time full and strong; artificial respiration was resorted to three times and three times stopped but still the patient would not breathe himself. His pupils were widely dilated. As his pulse was so good I concluded that the cessation of respiration was due to increased intracranial pressure from engorgement of the brain due to the administration of ether. So while Dr. T. Ryan and Dr. Beamish kept up artificial respiration I rapidly turned down a flap of scalp above the ear and trephined. The dura bulged into the trephine opening, which was enlarged downwards with bone-biting forceps.

On opening the dura the brain bulged markedly; the cerebral veins were very engorged. Sharp-pointed forceps were passed into the brain downwards and inwards over the region of the middle and inner ear and opened; immediately there was a gush of pus and about 6 oz. were evacuated, greenish and foul-smelling. A tube was passed into the abscess-cavity and brought out through a hole in the base of the flap; in a few minutes after the evacuation of the pus the patient began to breathe automatically.

In about five days the tube was pushed out by intracranial pressure. Some discharge continued for two weeks, the headache ceased, the eyesight improved and the patient made an excellent recovery, the only disadvantage being a small hernia cerebri at the site of the trephine wound, and this is diminishing in size.

The patient was discharged from St. Vincent's Hospital on June 26, and was shown by me at the meeting of the Ear, Nose and Throat Section of the Victorian Branch of the British Medical Association held on June 24 at Melbourne.

CLINICAL NOTE.

THE RADICAL MASTOID "FIRST DRESSING" SHOULD BE PAINLESS.

BY J. D. LITHGOW, F.R.C.S.E., etc.,

Edinburgh.

It is the common experience of otologists that the first dressing after the radical mastoid operation is certainly painful. The pain may be so severe as to necessitate the administration of a general anæsthetic; indeed, this is the custom of some authorities. Pain

is first complained of when the outer dressing is removed, the gauze having become dry and firmly adherent to the skin around the wound, the edges of the wound, the stitches or clips which are employed, and to the auricle itself. After this portion of the dressings has been removed, and it comes to taking the packing from the meatus, pain is even worse, the gauze having become firmly adherent to the cut edges of the meatus, the flap, and to the packing within the cavity of the mastoid. Even with the help of peroxide of hydrogen, the packing here is only removed with considerable pain, and sometimes even profuse hæmorrhage. The deeper packing from the tympanum, aditus, etc., comes away only when considerable force is used, and its removal is excruciatingly painful, the patient is frequently screaming with pain, and this is followed by more hæmorrhage, which fills the cavity. Apart from the question of pain and hæmorrhage, other untoward results may follow from the adhesive condition of the packing. The meatal flap may be dragged upon and displaced. If the lateral sinus or middle fossa have been exposed, damage to the dura may result from the traction on the adherent gauze. The facial nerve, if uncovered by bone, may also become adherent to the packing, and facial paralysis, more or less permanent, may result from a similar cause. Small vessels which have either been twisted or tied may also be a source of trouble by the clotted portion being dragged away. The gauze may even adhere to the incision and drag it open. It is evident that this tendency of the dressing to adhere to the wound is one that requires serious consideration. This tendency varies, firstly, according to the period at which the wound is dressed. Generally, the earlier the dressing takes place after the first two or three days the more adherent the dressing is found to be. About the fifth or sixth day there is a tendency for it to become somewhat looser.

The material employed for the packing is of great importance in regard to the tendency to become unduly adherent. The most objectionable dressing in my experience is iodoform Berlin twist or worsted. The numerous hairs of the material and its special tendency to become dry and hard, when once moistened with bloody discharge, cause it to become more firmly fixed to the wound than any other dressing material which can be employed, leaving out of the question here any consideration as to the value of iodoform as an antiseptic or the worsted as a drain, both very much open to question, and especially the latter. Plain selvedge gauze is less objectionable, and bismuth ganze is very much better,

but all these materials adhering to the wound may cause the difficulties mentioned. This tendency, then, does not rest entirely with the material employed for the packing, but is the result of the discharge and material forming a cement, which on drying fixes the two—the dressing and the wound—together, and to a great extent prevents the free escape of the discharge. This tendency may be entirely obviated by the application of sterile or, in addition, medicated vaseline applied to the wound and skin surfaces, or by having the packing impregnated with the material. If this method is followed the “first dressing” is no longer a matter for dread, as it is got over practically painlessly, the patient feeling perfectly comfortable during and after the dressing. I have employed this method exclusively during the last six years in my radical and acute mastoid operations, and I may say, without fear of contradiction, that it is the rarest thing for the patient to complain of pain during the dressing. This applies equally to young children, who are not at all backward in making any discomfort known. The method is, of course, equally applicable to any other operation where packing is employed, and is a distinct gain both to patient and operator. Another advantage of the method is that the skin and hair around the ear on that side remain perfectly clean; where this method is not employed the hair becomes matted with the discharge and blood, and the auricle and surrounding skin are similarly coated, and can only be cleaned with considerable difficulty.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

April 4, 1913.

MR. HERBERT TILLEY, *President, in the Chair.*

Steel Shawl-pin removed from one of the Hyparterial Branches of the Right Bronchus, where it had been Lodged for Ten Days.—Herbert Tilley, F.R.C.S.—B. W.—, aged forty-two, was admitted to University College Hospital on March 18, 1913. Ten days previously while holding the pin in her mouth she coughed and “felt the pin go down.” Fits of coughing lasting for fifteen minutes followed. Two days later felt intermittent pain in right side of chest near the mid-sternal line. On the sixth day more coughing, but none since. March 17: Patient was “screened” and the pin was located in the right bronchus with the point upwards; the pin was on a level with the neck of the

eighth rib. March 18: Patient was given a hypodermic of morphia and atropine at 5.30 p.m. and at 6 o'clock chloroform was administered, and when narcosis was established the larynx and trachea were painted with a 20 per cent. solution of cocaine and the right bronchus entered by the direct method (Brünings' bronchoscope). Considerable difficulty was experienced in seeing the pin because the point was directed towards the observer, and when it was located it looked like a thin thread of mucus. Twice it slipped from the grasp of the forceps, but at the third attempt it was slowly withdrawn with the bronchoscope. The operation lasted six minutes, and the patient left the hospital next day none the worse for her experiences previous to or during her short stay in the hospital.

Mr. TILLEY had brought forward the case because of the difficulty of seeing the foreign body. A pin, when inhaled into a bronchus, was apt to go down head first, hence on looking down at it one's line of vision was parallel to the shaft of the pin, and it was difficult to see anything at all. Had it not been for the X rays, the pin might have been missed entirely. Furthermore, the case showed that a patient might harbour a foreign body in the lung without any untoward symptom. On the other hand, four years ago he was asked to see a patient who it was thought had inhaled a foreign body. She had a slight evening temperature, a hacking cough, and there were fine *rôles* in the upper part of the left lung, so that the case might easily have been regarded as one of early tuberculosis had not the X rays demonstrated another reason for the symptoms.

An Instrument for Expediting the Examination of Embedded Tonsils.—Herbert Tilley, F.R.C.S.—The instrument is shaped like an ordinary Fraenkel's tongue-depressor, but the distal end is replaced by a small concave bar placed at right angles to the shaft. If the outer portion of the tonsil is pressed on the gland tends to face the observer, and often septic accumulation may be expressed which otherwise might pass unnoticed. It was useful in obtaining a more complete view of inconspicuous tonsils which often concealed septic accumulations—a fertile cause of obscure pyrexias in young children and of recurrent attacks of tonsillitis in adults.

Dr. DONELAN regarded the instrument as a valuable one, not only for examination, but for treatment, as in follicular tonsillitis, if one wanted to cauterise or otherwise destroy the crypts.

Cast of the Epithelial Lining of the Œsophagus, from a Case of Chloroform Poisoning.—G. N. Biggs, B.S.—The patient drank about 1 oz. of chloroform which was at once vomited. For two days she complained of pain in the throat, and difficulty and pain on swallowing. On the third day she vomited the cast. There was no hæmorrhage. The patient was given bismuth carb. in lanoline and paroline every four hours, and fed rectally for fourteen days. After six weeks the patient was examined by direct œsophagoscopy, when the surface of the œsophagus was found to be completely healed over and there was no tendency to stricture at any point. The patient has recently been examined by direct œsophagoscopy, and the œsophagus shows no tendency to contract at any point.

Sarcoma of the Right Tonsil.—G. N. Biggs, B.S., and William Turner, M.S.—Female, aged thirteen. The patient came to hospital on January 2, 1913, complaining of a sore throat and difficulty in swallowing.

Three weeks ago she noticed a lump on the right side of the neck, just below the angle of the jaw. Shortly afterwards she experienced a pricking sensation on the right side of the throat, and her breath became foul. During the last week she had noticed that a swelling had appeared in the region of the right tonsil. She had become thin during the last three weeks although her appetite had been good.

The right tonsil was enlarged to the size of a large plum, projecting into the pharynx and pushing the soft palate forward. The swelling was of a dark maroon colour, soft and fleshy in consistency, and was not tender to touch. The mouth was foul, but at that time no necrosis of the growth was present. There was an enlarged lymphatic gland just behind the angle of the jaw, painless and very hard on palpation. Four days later the condition had advanced with extraordinary rapidity; the child looked pale and anæmic, and was very ill. Temperature, 101° F.; pulse, 120. Her breath smelled gangrenous. The whole of the tonsil had become gangrenous, and this process had extended on to the right margin of the soft palate. The gland in the neck had markedly enlarged, and two or three other deep cervical glands in the region had appeared. These glands had now become tender. The child was admitted into hospital and given an antiseptic mouth-wash, but the gangrene continued to spread. Blood-count showed anæmia of secondary nature, with high mononuclears and low polymorphonuclears. Wassermann reaction negative.

Three days after admission the growth had affected the right half of the soft palate, including the uvula. The picture presented at this stage was interesting. At the line of extension there was a swollen and injected line of about 3 mm. width, running across the palate from the anterior right-hand corner to the posterior margin to the left of the uvula. The palate behind this line was a gangrenous slough, pieces of which could be easily picked away. Thus the gangrenous process apparently followed immediately upon the extension of the growth. A week after admission the whole of the soft palate was involved, and on January 16 it had spread to the left tonsil, the whole of which became gangrenous. The odour at this time was horrible, and no deodorants had the slightest effect upon it. The posterior pharyngeal wall became involved and gangrenous towards the termination of the case, and the lateral pharyngeal wall below the tonsil also became gangrenous nine days after admission. The glands in the neck rapidly enlarged, so that at the end of the week there was a nodular mass behind and below the angle of the jaw on both sides, but they did not break down. Swallowing rapidly became almost impossible, and very little nourishment could be taken. Although the gangrenous process was so intense no serious bleeding occurred.

On January 18 she died from acute toxæmia, without any other symptoms appearing. A bacteriological examination revealed streptococci and staphylococci in large numbers in the throat.

Post-mortem.—The pharyngeal space was occupied by the enlarged tonsils, which met in the middle line, and had a black, gangrenous appearance. Soft palate was involved and the uvula had disappeared. All the glands in the neck on both sides of the trachea were much enlarged, discrete, soft, and not adherent to each other or to the adjacent structures. On section they were uniformly white in colour, fleshy in consistency; the glands in the upper portion of mediastinum were also enlarged. On the pleural surface of lower lobe of right lung two small unpraised swellings, the size of a split-pea, were present. ? Secondary

deposits. Gland of neck showed round-celled sarcoma with very little interstitial tissue lympho-sarcoma.

The PRESIDENT considered that the history of the case was almost unique in the rapidity of the ulceration.

Cyst of Arytæno-epiglottidean Fold which Burst Spontaneously.—**E. A. Peters, M.D.**—**M. C.**—, aged sixty-three, complained of slight choking sensation and loss of voice for a month. A red, tense swelling occupied the fold projecting beyond the middle line; the arytænoid was forced into a position of phonation. The voice was hoarse and passed into a whisper. Seven weeks from the commencement of the symptoms the cyst appeared paler and more prominent. At eight weeks the voice suddenly returned, and the cyst will be seen to have collapsed and to exude mucus from a rupture on the upper surface.

Dr. PETERS said the point of interest to him was that the cyst had refilled. Some of these, if punctured, disappeared permanently; but that was not the case here. The patient complained of a little tenderness, but there had been no other evidence of inflammation. When the cyst burst it was possible to see mucus escape from the rent surface. He would either pinch out a small piece of the surface, or apply the cautery, and make a larger opening.

The PRESIDENT asked the experiences of members as to these cysts filling up again after galvano-puncture. He had not been fortunate in this respect with a recent case in which he had used the method. To cure them he found it necessary to make a fairly thorough removal of the cyst-wall. The previous day he had seen a patient who he thought risked sudden asphyxia, for an enormous cyst was filling the entry into the larynx and seemed to grow from the left arytæno-epiglottidean region. He cocaine'd its surface, punctured the wall with the galvano-cautery, and then removed the cyst-wall as far as possible with forceps, used by the direct method. Finally he applied the galvano-cautery to the inside of the cyst-walls. This was done some three weeks ago, but yesterday the patient returned with what appeared to be a recurrence of the lower part of the cyst and a thickening (? perichondritis) of the left half of the epiglottis and aryepiglottic fold.

Dr. FITZGERALD POWELL said that for such cases he had been in the habit of using the galvano-cautery to destroy the wall of the cyst, and applying it pretty freely to the inside of the cyst, with the object of setting up adhesive inflammation. In this way he had obtained cures, and had not seen any recurrence of the cysts. Merely pinching out a portion of the cyst-wall would not destroy the cyst, which was liable to refill unless adhesive inflammation took place.

Mr. WAGGETT thought the ideal method would be the suspensory method, using one hand to fix the cyst-wall and the other to cut it off cleanly with the cautery.

Mr. BADGEROW had used the galvano-cautery in three cases, and there had been no return of the cyst.

Cyst on Epiglottis, with Symptoms suggestive of Œsophageal Stricture.—**James Donelan, M.B.**—A man, aged fifty-nine, came to Hospital three weeks ago. He had been treated for gastritis. Six weeks ago he began to find difficulty in swallowing solids, and about three weeks later liquids. He can, however, at times swallow solids without much difficulty, and seldom has trouble with liquids. The difficulty takes the form of a sudden closure of the gullet, with rejection of the food followed

by a copious flow of mucus. No tumour or other abnormality could be detected by Röntgen-ray examination. A test-meal containing bismuth was observed to pass without difficulty. The case appears to be one of spasm of the gullet, but how far the cyst on the epiglottis may act as an exciting cause could not be determined.

The PRESIDENT believed Dr. Jobson Horne had shown a case of a cyst of the epiglottis in which pain and difficulty of swallowing was complained of. Many weird symptoms were attributed to it, yet the cyst was only a small one.

Dr. FITZGERALD POWELL said it seemed extraordinary that a small cyst in the epiglottis should cause so much trouble. There was difficulty in seeing the patient's arytaenoids. The posterior wall of the pharynx seemed to bulge forward, and he wondered whether there might be a neoplasm in the pharynx.

Dr. DONELAN replied that he proposed to make an endoscopic examination. The patient was able to swallow good meals of meat, fish and potatoes occasionally, and the screen examination revealed no abnormality.

Post-diphtheritic Adhesions of the Soft Palate.—James Donelan, M.B.—The patient, a girl, aged seventeen, was shown at the last meeting.¹ It was suggested that the cicatrices about the mouth might be due to syphilis. The exhibitor, though he had no reason to agree with this view, has tried a mixed course of mercury and iodides during the last four weeks without the smallest resulting alteration in the appearances, save a little herpetic eruption on the lip. He still accepts the mother's account that they were caused by the formation of diphtheritic ulcers on the skin about the mouth. Members whose experience goes back to fifteen or twenty years ago will doubtless remember that this kind of disfigurement was more common than since the introduction of antitoxin.

The PRESIDENT reminded the meeting that the question raised when the case was previously shown was as to whether diphtheria pure and simple could cause these ulcerative lesions, or whether they were caused by a simultaneous scarlet fever, or, on the other hand, were they of syphilitic origin or even due to some other microbic infection?

Dr. WYLIE considered that the case still looked like a syphilitic one; and that if "606" were given a difference would soon be manifest.

Dr. FITZGERALD POWELL said that even if syphilis were the cause, anti-syphilitic treatment would have no effect on the resulting scar-tissue. The Wassermann test would be the best guide. The question of the extensive ulceration and formation of scar-tissue, said to be produced by scarlatina, was discussed some years ago, when similar cases were shown, and the general opinion was that in these days of antiseptics this severe ulceration and scarring did not take place in scarlatina, but that nearly all cases were due to syphilis.

Dr. KISCH had gone carefully into the history; there was no suggestion of syphilis in the case. At that time he gave her a course of mercury and iodide, not with the idea of altering the local appearances, but to see what the effect on the general condition would be. He was not convinced that it was diphtheria, which of itself very rarely caused ulceration, but suggested that the condition was due to a streptococcal infection.

¹ See JOURN. OF LARYNGOL., RHINOL., AND OTOL., October, 1913, p. 549.

Dr. DAN McKENZIE thought that the throat appearance was that of syphilitic adhesions. He had never seen such a degree of scarring from diphtheria.

Dr. PETERS suggested that in this case there might have been a mixed infection—scarlet fever and diphtheria. The latter disease by itself rarely, if ever, caused ulceration.

Dr. WATSON-WILLIAMS suggested that the title of the case should be so stated as to suggest that it might not be diphtheritic. There was only the mother's statement that it was diphtheria.

Dr. DONELAN replied that there was no reason whatever to suspect syphilis. The father and mother were healthy, and so were all the other children. The disease occurred and the cicatrices about the mouth were formed thirteen years ago, when the child was only aged four. The diagnosis on the charts and books of the time appeared as diphtheria. Though it was nowadays rare he did not agree that severe diphtheria was incapable of causing scarring about the mouth from acrid nasal and buccal discharges with resulting ulceration. He had himself seen several such cases, and one in which a diphtheritic patch had formed over the sternum with a resulting cicatrix.

Killian's Suspension Apparatus in Laryngeal Tuberculosis.—E. D. Davis, F.R.C.S.—A well-developed, healthy-looking young man with destruction of the upper portion of the epiglottis. When first seen the granulation-tissue of the epiglottis obscured the view of the larynx. After several unsuccessful attempts to remove the diseased portion of the epiglottis with punch forceps, the patient was anæsthetised and Killian's suspension laryngoscopy apparatus was used and the epiglottis "trimmed." With the exception of the right ventricular band and cord the lesion appeared to be confined to the epiglottis. Sputum: Tubercle bacilli present. Chest: Obscure physical signs.

Mr. E. D. DAVIS did not think he could have completed the operation but for this instrument, which enabled one to use both hands. Other attempts to remove the granulation-tissue had failed.

Tumour and Microscopic Section from a Case of Papilloma of Soft Palate.—Walter Howarth, F.R.C.S.—The case was shown at the last meeting.¹ At the operation it was found that the tumour infiltrated the palate and extended deeply into the lateral wall of the pharynx on the left side. Bleeding was very troublesome, but a laryngotomy was avoided by the use of Kuhl's peroral intubation apparatus. The section shows a round-celled sarcoma.

Mr. HOWARTH said he thought it was extraordinary for the patient, aged only seven, to have had a papilloma last July, a pure fibroma in December, and a round-celled sarcoma in March. There were no enlarged glands in the neck, but he removed soft palate and tonsil, and as much of the tumour as extended into the lateral pharyngeal wall. He had to leave a raw surface, but it granulated up, and so far there was no sign of recurrence. There was considerable bleeding, but it was controlled by forceps in the usual way. There was no tendency to œdema after the use of the per-oral intubation in childhood.

Old Specific Laryngitis.—F. F. Muecke, F.R.C.S.—Urgent tracheotomy done five years ago. Patient returned to the hospital with increased

¹ See JOURN. OF LARYNGOL., RHINOL., AND OTOL., October, 1913, p. 542.

difficulty in breathing. Small warty growth in the trachea at the end of the tracheotomy tube.

Dr. DUNDAS GRANT had reported a case in which, after performing tracheotomy for papillomata of the larynx, he found the patient was still unable to breathe until, by a great effort on the patient's part, a portion of soft papilloma was coughed up through the tracheotomy wound. Dr. Grant found it to be a sessile growth on the wall of the trachea, and he pulled away the remainder of it. That was the only occasion on which he had found anything similar to this case.

Mr. MUECKE had had another somewhat similar case. An actor, eight years ago, had had tracheotomy done on account of a syphilitic lesion of the larynx. He went back to Vienna, and two years ago he had "606" on two occasions. He had not been able to speak for eight years, nor breathe through the mouth; a few days ago he felt some tickling, which forced him to cough, and after causing him tremendous pain a piece of bone came away about $\frac{1}{2}$ in. square, partly necrosed. Then quite suddenly he found himself able to speak and breathe well.

Carcinoma of Left Vocal Cord; Operation; Arrest.—G. Secombe Hett, F.R.C.S.—Man, aged fifty-five, schoolmaster. Carcinoma of left vocal cord operated on two and a half years ago; thyrotomy; uneventful recovery. The growth came so near to the anterior commissure that it was found advisable to remove a small portion of the thyroid cartilage together with the anterior third of the right cord. Patient and section of growth were shown twelve months ago. The case was then shown for the opinion of members as to whether vocal exercises might improve the voice. The patient has been treated in this way with great improvement to his phonation. He is following his occupation, and teaches a class of boys.

The PRESIDENT said that vocal exercises had resulted in considerable improvement. In such cases a false cord often was produced, and a fairly good voice ensued.

Double Abductor Paresis and Stricture of Deep Pharynx and Upper End of Œsophagus, after accidentally Swallowing Glacial Acetic Acid in October, 1912.—William Hill, M.D.—Patient had been dilated up with Brünings' dilator (in January of this year); better for two months. Recently stricture symptoms reappeared. Intubated; swallows by side of tube.

Dr. DAN MCKENZIE said that there was an event in partial stricture of the Œsophagus which had happened twice in his experience, and that was blocking of the stricture with food, whereby a partial was converted into an absolute obstruction. The first case was that of a woman who came to him with absolute inability to swallow of sudden onset. Even liquids returned. He found himself unable to pass a large Œsophageal bougie, but succeeded in getting a soft rubber catheter to pass. After removing it he tried the swallowing but the obstruction remained absolute, so he reinserted the catheter and poured in some milk through it into the stomach. The patient had had nothing to eat or drink for some time, and the sudden ingestion of cold milk made her sick. She vomited the milk and with it a whole green pea. Immediately thereafter he found that the power of swallowing was quite restored. Further examination showed that the patient had an aneurysm. The explanation of this history was that the aneurysm had induced an obstruction of the gullet permeable in the ordinary way, but still so small that it could be perfectly

blocked by a green pea, which acted like a ball valve, permitted the rubber catheter to pass, but was not displaced until the fluid propelled from below in the act of vomiting carried it away. This case, which he had seen several years ago, he had published at the time in the *British Medical Journal*. The second case had been seen by him about a fortnight ago, the upshot being less fortunate than that of the case he had just narrated. The patient, a man, had had several distinct attacks of complete oesophageal obstruction, all of which had until then been relieved spontaneously. X-ray examination showed the stricture to be located at the cardiac orifice. The oesophagoscope, when inserted, plunged into a sacculated oesophagus full of dirty fluid in which were floating masses of half-chewed meat. These masses blocked up the orifice of the aspirator so frequently that the emptying of this sac was a tedious and laborious task. After the liquid had been got rid of, it was found that the oesophagus was blocked by about half a dozen chunks of chewed meat, which had to be removed with Brünings' forceps before the actual stricture was reached. Finally, one of Hill's feeding-tubes was inserted, and by it the patient was fed for twenty-four hours. At the end of that time, however, he insisted on the removal of the tube, and in the absence of the speaker this was done. As the patient would not allow any further interference from above, a gastrostomy was performed, but a few days later he died. The record of the case was incomplete, as a *post-mortem* examination was not made. The only evidence as to the nature of the stricture was negative; the surgeon who performed the gastrostomy was unable with the finger in the stomach to find any sign of disease about the cardiac orifice, while the speaker had seen no signs of growth while working with the oesophagoscope.

Mr. WAGGETT asked Dr. Hill whether he found that his patients preferred the feeding-tube in the mouth in preference to the nose. His own experience was that it was preferred through the nose.

The PRESIDENT said his experience with such patients was the same as that of Mr. Waggett.

Dr. PETERS asked whether dilatation was so helpful in these cases as the passage of a small tube. Apparently there was an interference with the musculature of the wall, and probably it was that more than stenosis, which prevented the passage of food. So that probably the passage of a small tube was quite as efficient as dilatation. There was always a tendency to recontraction. The question of nasal *versus* mouth-feeding was largely a question of nasal obstruction. If the nose was obstructed or there was mechanical difficulty the passage of even a soft tube was very irritating, whereas if the patient habitually breathed through the nose freely, it was easy to feed by the nose.

Dr. DONEGAN said that all patients who had to be fed in this way seem more comfortable with the tube through the nose. Of course much depended on the size of the nasal passage and whether there were any septal projections liable to be irritated. This was of great importance in cases like the present where the tube had to be permanently retained. Tubes made specially with a soft nasal portion gave good results in these cases.

PROCEEDINGS OF THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY.

May, 1913.

Are the Ocular Manifestations in Nasal and Aural Diseases due to Involvement of the Sympathetic Nervous System?—
William H. Haskin.—He has never been satisfied with the various theories in explanation of the many ocular symptoms in cases in which there are no intracranial complications, orbital abscesses, or even pressure within the diseased sinuses themselves. He has been unable to find reports of microscopic proof of neuritis, except where meningitis was present. Only cases in which ocular disturbance was relieved by treatment of the nasal sinuses are considered in the paper. The relationship of the optic nerve to the post-ethmoidal cells and to the sphenoidal sinuses had been very thoroughly described, but few authors, apparently, had noted the intimate association existing between the fifth nerve and the sphenoids. The proximity of other orbital nerves to the sphenoid sinuses and the possibility of their involvement in disease of the sinuses had been noted. He wished to add the sympathetic nerves to the numerous relationships already observed, and to emphasize the very intimate contact that exists between these nerves and the bony walls of the sinuses. Inasmuch as the majority of the ocular and nasal symptoms are due to vasomotor disturbance, and as the sympathetic nerves are the vasomotor nerves, it would seem that a reasonable explanation for most of these manifestations might be found in irritation of this system. Special emphasis was laid upon the following points: (1) That the sympathetic nerve is the vasomotor nerve of the eye—that is, it controls the blood-supply. (2) That these nerves after leaving the superior cervical ganglion form the carotid plexus, and then on entering the cavernous sinus form the cavernous plexus and lie on its inner wall in contact with the sphenoids. (3) That the branches, after leaving these plexuses, often run through small bony canals in the walls of cavities or sinuses that become inflamed, such as the Vidian, the greater and lesser petrosal nerves and the branches entering the tympanum. Remembering the relationship, and considering that almost all of the ocular disturbances are true disturbances of the vasomotor system, the rational explanation of these symptoms seemed to be to attribute them to the sympathetic nerves. The delicate fibres of this system are much more exposed to irritation from inflammations in the accessory sinuses, and even in the ear, than any of the other nerves. Physiological experiments upon the orbital, and especially upon the sympathetic branches, show that all the ocular manifestations described have been caused by section or by irritation of the sympathetic nerve supply. The probable influence of the trophic nerve-fibres, which are also sympathetic fibres conveying impulses from the centres to the periphery, was suggested. At first the sympathetic nerves are merely irritated by the inflammatory sinus, symptoms of increased vasomotor action resulting; after long irritation, however, the trophic nerves become destroyed, and thus destroy the trophic control of the optic nerve, which loses its function, although actual neuritis has never been present.

The Hiss Leucocyte Extract in Complications of Nasal and Aural Surgery, with Report of Cases.—William H. Haskin, M.D.

—The late Professor Hiss's first report on the leucocyte extract, published in the *Journal of Medical Research*, in November 1908, gave in detail the results of his experiments, and the exact method for the preparation of the extract. According to theoretical considerations, in many diseases one probably has to deal with an immunity a large part of the mechanism of which is individually cellular, not only in the sense of phagocytosis and digestion, but in the neutralisation of poisons given rise to by disintegration of the bacteria. The protecting cells in this mechanism must intervene, and, unaided by bodies in the plasma, must neutralise within themselves the poisonous products of the invading micro-organisms. This gave rise to the idea of aiding the leucocytes in their fight against invading germs by furnishing them as directly as possible with the weapons of defence which were being taken from them by the germs. In order to accomplish this, it was assumed, an extract of the active substances of the leucocytes might be employed. It was also assumed that extracts would be more efficacious than living leucocytes, since, being diffusible, these substances would probably be distributed impartially to all parts of the body by the circulatory mechanism, relieving the fatigued leucocytes and protecting, by any toxin-neutralising or other power they might possess, the cells of highly specialised functions. Such active substances, freed from the cells by extraction, might serve to neutralise poisons in the blood, might alone or in combination with bodies already in the blood act deleteriously on the bacteria, and thus protect and augment the activities of the flagging leucocytes by supplying them with their own weapons in the fight against the invading organisms. This purpose might be still better served by the extract of such exudates from previously immunised animals. Professor Hiss reported the curative influence of the extract in animals infected with staphylococcus, streptococcus, pneumococcus, meningococcus and *Bacillus typhosus*. He also reported its use in twenty-four cases of meningitis in man, and its use in acute lobar pneumonia in man.

Dr. HASKIN reported in detail three desperate cases, all in the hospital at the same time: (1) Bacterial mastoiditis, with disintegration of both processes, and necrosis of the left sinus for half an inch, in a child one year old. The extract was administered daily for seven days. On the twenty-fifth and twenty-sixth days trophic sloughs were discovered over the torcula, first of the right, then of the left side. The extract was again administered daily for three days. Both wounds and the sloughs were completely healed at the end of the fifth week. (2) Large subperiosteal abscess (*Staphylococcus aureus*) in a child two years of age. Operation ten days after onset, following which temperature fell from 103° F. to normal, remaining so for four days. A sudden rise of temperature to 104°, with pulse of 136, and respiration 38, accompanied by constant coughing and crepitation over lower right lung, caused the administration of the extract (10 c.c.) on the fourth day, and repeated on the fifth. Fall of temperature in forty-eight hours, and clearing of the lungs resulted. Healing of the mastoid wound was complete at the end of the third week. (3) *Streptococcus capsulatus mucosus* bacteræmia, without operative measures, in a child of six. History of pain in right ear, of several days' duration, but with no discharge. Nothing but high septic temperature (104°) indicated involvement of the mastoid. On the fifth day after admission to the hospital, the pathologist having reported *Streptococcus capsulatus mucosus* bacteræmia, the leucocyte extract was

given daily (10 c.c.) from February 24 to March 21, on which later date the patient was discharged, all the symptoms having subsided, this being the only known case of actual *Streptococcus capsulatus mucosus* bacteræmia recovering without operative measures.

Dr. DWYER appended to the paper a summary of thirty-nine cases of different infections treated by other physicians by means of the extract. It should be borne in mind that the extract is in no sense a vaccine, an antitoxin, or a specific. It has no connection whatever with any bacteria, being purely a physiological extract and emulsion of the leucocytes themselves, which, on being injected into the cellular tissues, is taken up into the circulation, furnishing food to the overtaxed and exhausted leucocytes of the body. The average dose is 10 c.c. The necessary dose for each case has not been determined. The extract in no case had proved harmful. It can be used in twice the original strength without injury to the cellular tissues. The proof of the great value of the extract rests upon the fact that it has been subjected to the severe test of use only when the patient was practically *in extremis*, when it was felt that nothing else could save life.

Dr. SAMUEL J. KOPETZKY corroborated Dr. Dwyer's observations concerning the value of Hiss leucocyte extract in regard to its being absolutely harmless, and also in that it tides the patient over an acute period. But he called attention to the fact that the evidence presented was not conclusive of the contentions made for the extract, nor was he satisfied with the statistics presented by the reader of the paper as having proved conclusively the value of the extract over the usual methods of treatment.

Dr. LEE M. HURD cited two cases in which Dr. Dwyer had administered the leucocyte extract for him. The first was spontaneous osteomyelitis springing from the ethmoid cells, in which the extract had no effect. The second was a case of erysipelas developing seven days after operation, by the Killian method, for orbital abscess and frontal sinus disease. On the seventh day the patient had a chill, with a rise of temperature to 105° F. The extract was used, the temperature fell, and the patient made a prompt recovery.

Dr. HASKIN, in reply, reiterated the fact that every case reported was practically *in extremis* when treatment with the extract was instituted, so that the method had been given the hardest kind of a test. The only place where the extract is prepared is the laboratory of the College of Physicians and Surgeons. It is easily obtainable and will keep in an ice-box.

Some Observations on Intranasal Surgery.—Charles W. Richardson, M.D.—Rhinologists are beginning to look beyond the nose to determine the cause and to remove the conditions which bring about various diseased activities within the nasal chambers. Vasomotor disturbances of the upper respiratory tract, formerly treated by cauterising or removing the turbinates, can be relieved or removed and a moderate degree of simple nasal treatment instituted, in which surgery plays no part. A resolution with permanent return to normal can be assured. Congestion of the turbinates, with intermittent turgescence of varying degrees, has often been treated by removal of the middle and inferior turbinates, when properly applied therapeutic measures would more certainly and rationally have accomplished the purpose. In many such cases the patient has been found to be partaking too largely of carbohydrate and sugar; they are generally overfed, improperly clad, and do

not take the requisite amount of physical exercise. The object of the paper was to impress the fact that there are many disturbances of the general system which influence the upper air-tract from the pathological point of view, and the relationship of these to the disturbances noted must be thoroughly weighed before resorting to operative measures.

Dr. O. A. M. McKIMMIE said that patients who are given instruction about diet and other hygienic measures do not carry them out. Unless something is done locally they think nothing is being done.

Dr. H. HOLBROOK CURTIS referred to the use of the *Bacillus bulgaricus* in the class of cases in which the alimentary canal plays so important a part. He had often found the result marvellous. Spraying the nose with the pure culture of the bacillus in veal broth, and the administration of the same internally, will relieve many turgescent conditions in the nose. In oæna and rhinitis sicca he was still using the *Bacillus bulgaricus* in suspension, and considered it the most efficient treatment.

Nasal Polypi involving the Orbit, Frontal Sinus, and Anterior Fossa of the Skull.—William B. Chamberlin, M.D.—The patient, male, aged forty-one, consulted him on account of a discharging sinus beneath the left eyebrow. The history was that several years ago masses of polypi had been removed from both sides of the nose, affording temporary relief from the nasal obstruction of which he complained. There was no history of pain, and the trouble had not prevented him from working. Examination showed exophthalmos of the left eye, considerable swelling of the soft parts above it, and a fistula immediately beneath the centre of the eyebrow. Both nasal fossæ were completely filled with polypi. An attempt was made to clear the left fossa under cocaine, but it was found impossible to remove all the polypi on account of the bleeding. Four days later, under general anaesthesia, the skull cavity was opened through the frontal sinus. On removing a portion of the anterior sinus wall, above the inner canthus, a plate of bone was encountered lying free and quite movable. This proved to be the posterior wall of the sinus, and was removed as a sequestrum. Masses of tissue resembling the convolutions of the brain immediately bulged through the opening. There was no pulsation, and the colour was that of the ordinary nasal polyp. To afford greater working space, a vertical incision, joining the first incision at right angles, was carried upward 4 cm., while the anterior cranial wall was resected over an elliptical area of 3 by 5 cm. The tumour mass was carefully removed, piecemeal. The only point of origin within the skull cavity was a pedicle, fully 1 cm. in diameter, situated at about the centre of the internal or median wall [? of the frontal sinus.—ED.]. The cavity revealed after entire removal of the tumour mass was apparently co-extensive with the anterior fossa of the skull. The orbital roof was removed wherever necrosed bone was discovered. Masses of polypi were removed from the fronto-nasal duct. Further operative interference was not deemed advisable at this time. The wound was packed with gauze and a wick carried through the enlarged fronto-nasal duct into the nose. Recovery uneventful, and patient left hospital at the end of one week. Enormous masses of polypi, together with most of the middle turbinate and ethmoid labyrinth, were subsequently removed from the right fossa, and more polypi and part of the middle turbinate from the left fossa. The external opening has gradually grown smaller, and when nasal drainage is unobstructed can be closed entirely. The following

points of interest present themselves with reference to the case: (1) The entire absence of symptoms following compression of so large a brain mass. There was no headache, no paralysis, and the mentality seemed good. (2) The presence of polypi in this situation. (3) The absence of infection. (4) The ultimate outcome. Will the cavity fill with granulations, and so become obliterated, or will it persist? The author was inclined to believe it will remain practically the same. The distance from the outer surface to the posterior wall, as measured by the probe, is now 5 cm.; the distance to the extreme posterior external angle measures 7 cm.

Dr. THOMAS H. HALSTED said that this case illustrated the extent to which disease of this sinus might progress without producing cerebral symptoms even with the posterior plate gone.

Dr. ROSS HALL SKILLERN thought there must have been a pre-existing mucocoele of the frontal sinus, and at the same time, perhaps, a hyperplastic ethmoiditis. Polyps, as is well known, always grow in the line of least resistance. In Dr. Chamberlin's case there were probably dehiscence in the lamina papyracea and frontal bone, which a growing mucocoele might cause. He had always seen a portion of the orbital wall lacking in operations for mucocoele. The mucocoele might have broken through into the eye, and the mucous polyp might have grown through this break into the anterior cerebral fossa against the frontal lobe, continuing to develop until the entire fossa was filled. If the growth had been thoroughly outlined, instead of being taken out piecemeal with forceps, it would have been possible to make a diagnosis.

Dr. JOHN M. INGERSOLL had thought the X-ray plate a faulty one at first, and was surprised to see at the operation what the actual condition was. He had watched the case with a great deal of interest. The remarkable absence of symptoms must have been due to very gradual development of the polypi and to consequent gradual development of pressure upon the brain. Referring to Dr. Skillern's suggestion with reference to uncovering the entire cavity, the speaker said this would have entailed the loss of nearly half of the skull anteriorly.

Dr. CHAMBERLIN, in closing the discussion, emphasised the point of origin of the mass. How to close the cavity was a problem. After removal of all the bony tissue the scalp might have been allowed to prolapse down over the cavity, but this would leave a frightful deformity. It would have been better to get sufficient drainage through the nose. It was possible to get a catheter or probe through the naso-frontal duct at present, but the opening was not large enough to allow free drainage at all times. Until free drainage through this passage could be secured the anterior opening could not be closed.

The Relation of Nasal Conditions to Anaphylaxis and Asthma.—Justus Matthews, M.D. (Mayo Clinic, Rochester, Minn.)—The serum disease was among the first phases of anaphylaxis to be carefully studied as to its ætiology, symptomatology and pathology. The blood or serum of many animals, when introduced into the blood or tissues of certain other species or animals, is more or less toxic. But men, rabbits, guinea-pigs and other species receive horse-serum without reaction, except in the cases of individuals having the state of hypersusceptibility called allergy or anaphylaxis. The reception of the initial dose of serum by an animal not previously sensitised may or may not induce symptoms. The absorption of the second dose of the same serum will, under favourable circumstances produced changed or allergic reaction.

From experiments it appeared that the reaction may, and probably does normally, occur without the assistance of the nervous system.

Under certain conditions animals may be sensitised by the taking of an antigen into the stomach. Guinea-pigs, for example, become sensitised by the feeding of raw horse-flesh, and will give the characteristic anaphylactic reaction to the serum or to other tissues of the species. These animals may also become sensitised to the horse by confinement in the same room through the inhalation of emanations.

The majority of the deaths following the therapeutic injection of horse-serum have occurred in persons subject to horse-fever and asthma, or in those sensitised by previous injections. The symptoms in these cases, while exactly typical of anaphylactic shock, are those of an extreme asthma resulting in asphyxia and death. Hay-fever, rose cold, and similar affections occur in individuals whose membranes are hypersensitive to specific varieties of pollen, and their reactions are analogous to and undoubtedly identical with the local reaction of experimental anaphylaxis. The asthma often associated with the local symptoms of hay-fever, etc., is induced by the entrance of the same antigen into the blood or tissues, usually through the mucous membranes of the upper respiratory tract, and is the typical respiratory disturbance of acute non-fatal anaphylactic shock. Clinically, asthma produced by these known foreign proteins differs in no respect from the more common form of the disease known as spasmodic or bronchial asthma, except that in the latter the identity of the foreign protein causing the reaction is unrecognised.

Susceptibility to anaphylaxis has been observed to vary greatly in individuals. The so-called asthmatic tendency has in a similar way long been known to be marked in certain persons and families, and heredity has undoubtedly an important bearing on the ætiology of the disease. It has been assumed that the predisposition was inherent in the nervous system, and this may be so in some cases; but there is no proof of this assumption, whereas it has frequently been observed that many of the individuals supposedly subject to heredity may have very evident ætiological factors in nasal polypi, suppurating sinuses, etc., the removal of which has relieved the asthma. From this it would appear that the essential inheritance has been an anatomic or functional predisposition to affections of the upper respiratory tract probably associated with a susceptibility to anaphylactic sensitisation.

During the past four years there have been examined in the Mayo Clinic about 300 cases of asthma. In over 90 per cent. of the cases the principal lesions which might be considered as ætiological were in the upper respiratory tract. Chronic suppuration or the retention of mucoid secretions in the nose or accessory sinuses occurred in the majority of these cases. Treatment was directed toward the object of securing free and continuous drainage of every portion of the tract, and little attention was paid to possible reflex factors of ætiology. In the majority of the cases the relief of the asthma corresponded almost exactly with the degree of success in obtaining the result sought—that is, the prevention of the retention and reabsorption of mucous secretions. The relief of asthma by any known treatment does not mean that the patient is permanently cured, since the susceptibility remains through life, and symptoms will recur whenever there exist conditions favourable to the production and absorption of the specific antigen to which the individual is sensitive.

Various methods of desensitising animals have been discovered, but no method yet reported gives a lasting immunity, and all are attended with high mortality. Until a safe and efficient method of desensitising

is possible the treatment of asthma must be directed, as in the past, to the relief of symptoms by whatever measures are indicated in each individual case.

Dr. J. A. STUCKY believed less and less in the need for local treatment in asthma. Of course, if pressure from the turbinate bodies resulted in the absence of free drainage, this pressure must be removed. The most important part of the treatment of asthma, however, is systemic. He had seen good results from the use of thyroid extract, five to ten grains administered three times a day until there is slight acceleration of pulse. Local treatment with adrenalin and cocaine did more harm than good.

Dr. WILLIAM H. HASKIN thought that operative treatment was seldom necessary. For fifteen years he had been employing suction in these cases, and had yet to see a case in which operation was necessary, except for the removal of middle turbinate bones or other obstructions to drainage. By going in under the turbinates, and pulling out the secretion by means of the suction apparatus, the mucous membrane would shrink in a short time. When the thick, glairy mucus had been removed it was possible to use any kind of local treatment. He had found nitrate of silver very useful. Vaccine therapy was of value, but failure often resulted because the true infected secretion was not reached in taking the smear from the nose. *Staphylococcus* infection was present in the majority of instances, and if an autogenous vaccine be made from this astonishing results could be obtained.

Dr. MATTHEWS agreed that one must look as much to the general as to the local treatment of hay-fever and asthma. In most cases, especially of asthma, the general conditions might predispose to rhinitis, but not be the immediate cause of asthma. The rhinitis was the usual cause of the asthma.

PROCEEDINGS OF THE FRENCH SOCIETY OF LARYNGOLOGY, OTOTOLOGY AND RHINOLOGY.

Meeting May 13, 1912.

President : G. GELLÉ (Paris).

(Translated by H. CLAYTON FOX, F.R.C.S.I.)

(Continued from p. 560, vol. xxviii, No. 10.)

Laryngostomy for Laryngeal Stenosis, Tubercular in Origin.—Pautet.—These cases are rare, and if Sargnon's statistics are perused only a few cases of recovery are met with. The author reported the case of a man (a hawker by trade), aged thirty-three, who consulted him for severe stenosis. Tracheotomy was performed as a matter of urgency. Some time afterwards a fresh attack of stenosis, very intense in character, occurred. Pautet endeavoured to remove an arytaenoid, but was unsuccessful owing to very marked reflexes. He then performed laryngostomy under local anæsthesia. Seven c.c. of novocaine dissolved in physiological serum sufficed to anæsthetise the region completely. Rubber dilatation was then tried, but proved a failure. A few days subsequently the

author practised through the opening galvano-cautery punctures and application of chemical caustics at six sittings. The patient gradually regained his normal weight and the general health became excellent. Operated on in May, in July, in spite of the author's advice, he resumed his occupation, and, blocking his cannula, shouted his wares. The patient still wears a tube, but the author hopes to be able to remove it shortly. This operation was only possible because the disease was not too far advanced in the lungs.

MOLINIÉ (Marseilles) said that dilatation by his method is also practised for tuberculosis. If one were successful in keeping the larynx open, surgical efforts could be brought to bear on the parts alone affected. Heliotherapy could also be carried out through this opening. The method would also be useful in the treatment of pulmonary tuberculosis itself (direct introduction of vapours, oils, aspiration of bronchial secretions). Tracheotomy sometimes gives excellent results in laryngeal tuberculosis; in all cases where he has adopted it it was to remedy stenosis and the patients were much improved.

PAUTET (Limoges) replied that this method, if excellent, is very delicate, and requires particular and constant care. He thought that the larynx ought only to be opened in desperate cases.

SARGNON (Lyons) used rubber dilatation when there was not too much inflammation. Gauze should be preferred in contrary cases. Red ointment is of service, suppressing fœtor and facilitating epidermisation. Laryngostomy is indicated in lupus, laryngeal tuberculosis, and even for cicatricial stenosis, for it enables one to cauterise under control of vision. Rubber dilatation must not be employed in laryngeal tuberculosis, for it causes ulceration.

Subglottic Angioma.—Joubert (Lyons).—The patient, who was suffering from dyspnoea, presented on laryngoscopic examination a bilobed tumour under the right vocal cord. This was removed by thyrotomy and proved on examination to be an angio-fibroma. Recovery followed. The author remarked the rarity of this neoplasm and the superiority of the trans-thyroid route, which, with a temporary tracheotomy, renders operating easy, and safeguards against hæmorrhage, œdema and asphyxia more surely than extirpation by the intra-laryngeal route.

Pharyngeal Asthma.—Chavanne (Lyons).—This is a rare manifestation. Adenoid vegetations and nasal obstruction may, however, by functional disturbance induce asthma. The author related the case of a girl, aged fourteen, who for a long time had experienced frequent attacks of asthma, commencing with a distressing feeling of tickling in the throat. Examination revealed a papilloma of the uvula; after its removal the crises immediately ceased.

Treatment of Lupus of the Mucous Membranes by Radium.—Broeckhaert (Ghent).—Radium gives excellent results in lupus. The author reported four cases, three of the ulcerating variety and one of the obstructive granular type. Radium is most potent in the granular form; in the obstructive variety it acts by destroying the granulations and converting the invaded tissues into a supple and cicatricial fibrous tissue. The author explained his procedure: 1 cgrm. of radium bromide is mixed in a special varnish and enclosed in a sheath of rubber. For lupus there are two methods—the destructive and the modifying. When it is a matter of expedition (obstructive variety) the

destructive method is to be preferred, but in the case of the ulcerating form it is better to proceed slowly and the modifying method should be chosen. This method consists in enclosing the radium in a thicker filter; the apparatus described above is then covered with a plate of thin aluminium. The time of exposure varies according to the extent of the lesion and the rapidity with which one wishes to act. In the ulcerative form the apparatus is placed in the diseased nasal fossa and retained in position by a small tampon of cotton-wool for an hour, three sittings for a week, rest for a week, three sittings during the third week and rest for a fortnight. Improvement is apparent after six or seven applications. In the granular form the granulations must be removed by curettage and radium applied for two hours at each sitting.

Correction of some Nasal Deformities.—**Molinié** (Marseilles).—The author classifies nasal deformities in two groups—saddle-backed and arched or hooked noses. As regards treatment the osteo-cartilaginous framework must in all cases be attacked endo-nasally. The author's procedure is as follows: The ala of the nose is raised with Palmer's speculum; the septum then stands out prominently and above one sees a fibro-mucous *cul-de-sac*. An incision is made in the latter and the superior border of the quadrilateral cartilage followed up till the nasal crest is reached, when a view of the part to correct is obtained. Two conditions may be present—exaggerated or defective development. In the first a rougine is introduced into the incision and the soft parts are elevated; the bone prominence is then obvious and can be easily reduced by gouge and mallet. For this stage of the operation the author showed a guillotine which he had devised. The projecting part having been cut down, pledgets of cotton-wool are inserted in the nasal fossæ and cold wet compresses applied externally for some hours. In the saddle-backed variety, if a crest accompanies the depression, it is utilised as a graft to fill the latter. When such material is not at disposal a piece of septal cartilage is substituted. Should a deviated septum be associated with the depression it is operated on and the *débris* used to fill up the gap. In the case of very marked depression of the bridge with a normal septum, one can without anxiety obtain sufficient material from the latter. In very pronounced saddle-back deformity resulting from syphilis the author prefers to restore the contour of the nose by introducing a fenestrated plate of aluminium beneath the skin, which soon becomes enveloped in fibrous tissue and incorporated with the nasal skeleton.

BOURGUET (Toulouse), after bilateral incisions, completely exposes the parts and can then operate under control of vision.

TRÉTRÔP (Antwerp) thought that one ought to be cautious in this form of treatment. The nasal fossæ constitute a septic focus, and a prosthetic operation may be the starting-point of a fatal infection. He preferred paraffin.

MOLINIÉ (Marseilles) found paraffin difficult to use. He does not elevate the periosteum, and prefers the unilateral incision as it is attended with less mutilation than the bilateral.

Special Case of Nasal Stenosis and Lingual Adhesion; Cure by Dissection and Osseous Resection.—**Bar** (Nice).—A young man, after an attempt at suicide by shooting, had his palatine arch destroyed and a portion of the mandible carried away. The lesions healed, but a cicatrix formed which gave rise to serious stenosis. The author thoroughly re-established the patency of the breath-way by osseous resec-

tion and dissection of the cicatrix and to-day the patient is quite well. The rhino-plastic methods employed for correcting nasal deformities cannot be adopted when all the framework of the nose has been previously destroyed, for the resection can only result in a shapeless mass, flaccid and without support, frequently terminating in atrophy and contraction. To remedy nasal stenosis, which so sadly affects the respiratory tract and its function, one will have recourse to dissection and excision of the offending intra-nasal parts resulting from the accident which has involved the region. Cicatricial adhesions fixing the tongue will be combated in a similar manner.

Latent Mastoiditis.—**Mignon** (Nice).—A girl, aged twelve, had for some time suffered from great debility, somnolence, with a temperature of about 104° F., markedly oscillating. Enteric fever was suspected, but a positive diagnosis was not possible. The temperature chart suggested the presence of a purulent focus. There was no pain on pressure over the mastoid process. Subsequently a sanguino-purulent discharge occurred from the ear lasting two days. Otoscopy revealed a perforation with a little pus in the tympanum. Under treatment the suppuration ceased, but the temperature remained high and the general condition did not improve. No pain was complained of and the child readily answered questions. Mastoiditis was diagnosed and it was decided to operate (three weeks after the onset). The antrum, small and deeply seated, was found to contain pus, as also did the adjoining cells. The antrum was thoroughly cleared out and the wall of the aditus resected as far as the tympanum. The temperature rose after the operation, but fell to normal next day. Rapid recovery followed.

BRINDEL (Bordeaux) was one of the first to note the frequency of latent mastoiditis (*Revue hebdomadaire de laryngologie et d'otologie*, Nos. 7, 8, 9, February 15, 22, March 1, 1912). Although in this form one cannot be sure of definite symptoms, there are, however, in every case of latent mastoiditis swelling about the mastoid and sagging of the postero-superior wall of the meatus, even when the patient makes no complaint as to the ear. He asked why Mignon resected the wall of the aditus up to the tympanum; he considered this precaution needless, the destruction of the postero-superior wall of the meatus being liable later on to compromise audition.

MIGNON (Nice) replied that swelling of the mastoid and retro-auricular sulcus with sagging of the meatal wall were not present in his case. If he opened the aditus it was because pus was there, and he advanced as long as he noted its presence, without, however, touching the tympanum.

BRINDEL (Bordeaux) replied that latent mastoiditis means mastoiditis without temperature.

Cerebellar Abscess; Operation; Recovery.—**Aboulker** (Algiers).—A man, aged forty-five, with a history of right-sided otorrhœa since childhood, recently experienced severe headache. When seen by the author his condition was serious. Staggering gait, rotation of objects, vomiting; pulse, 80; profound somnolence; nystagmus; Kernig's sign positive. The tympanum was full of granulations. Mastoid pain absent. Lumbar puncture was performed; cerebro-spinal fluid normal. Abscess of the posterior fossa was diagnosed. On operating a cerebellar abscess was discovered, containing 80 grm. of pus. The general condition rapidly improved. Only now the author learned that the patient had for

some considerable time suffered from occipital headache, and that on the day of the operation he could not use his right arm as he ought. Had these symptoms been known sooner the diagnosis might have been expedited. A fistula between the cerebellum and the posterior surface of the petrosal bone persisted for a year, and was continually drained. The fistula closed, but as discharge from the ear continued the labyrinth was operated on on three occasions.

Abstracts.

PHARYNX.

Levy, Max (Charlottenburg).—Complications after Adenoid Operation. "Zeitschr. f. Laryngol.," Bd. v, Heft 2.

Levy compares the small number of bad results recorded in literature with the large number of mishaps which surgeons acknowledge in private conversation. Further, these cases soon pass out of the specialist's hands, and the child's own doctor may not recognise the connection between the recent operation and the present illness. Of the complications hæmorrhage is the most common. This may only be recognised when the stomach becomes full and the blood is vomited. Levy is strongly against packing the naso-pharynx, and holds that the best practice is to again scrape the naso-pharynx, as the hæmorrhage is usually due to a semi-detached piece. Levy advocates the use of the Schütz-Passow instrument, as the Gottstein curette may remove a piece of the mucous membrane of the posterior pharyngeal wall. Injury to the Eustachian cushions and the soft palate are also referred to—the latter may cause nasal tone of voice. With regard to sepsis, Levy remarks that fever occurs after operation in 40 per cent. of cases. Healing occurs under a blood-crust. Infection of neighbouring lymph-glands is rare. Stiffness of the neck and torticollis are due to myositis of the prevertebral muscles. Acute otitis media occurs as a rule in cases in which the ear was already the seat of chronic inflammation before the operation. Levy says that, if we regard scarlet fever merely as a special form of sepsis, it is not remarkable that it should occur after operation on tonsils and adenoids. It is very difficult to diagnose scarlatina from the septic rash which sometimes follows operation—if there really is any difference!

Levy records a case in which otitis media and fatal meningitis followed the removal of adenoids; the otitis had healed before the meningitis occurred. Pyæmia and septicæmia with exophthalmos may follow the removal of adenoids, the infection passing from the pharyngeal plexus to the lateral nasal, facial, ophthalmic and central vein of the retina. Levy holds that cases which suffer from rheumatism after operation occur in patients who have had an angina a short time before. The surgeon should make sure that there has been no illness in the house for some time before operation.

J. S. Fraser.

NOSE.

Thomson, Sir StClair.—Two Cases to Illustrate the Advantages of Lateral Rhinotomy (Moure's Operation) in dealing with Malignant Growths of the Nose and Accessory Sinuses. "Proc. Roy. Soc. Med.," vol. vi, No. 5, March, 1913, Clinical Sect., p. 156.

One case was operated on two and a half years ago, the other six months; in neither is there any trace of recurrence.

After a description of the operation and its scope, the author points out that it has the following advantages: A large opening is obtained. Any neoplasm is well seen, particularly those of the ethmoid area and antro-nasal wall. Extensions to the infundibulum and sphenoid can be directly inspected. Hæmorrhage is less and more easily controlled. The incision is closed with a few horsehair stitches, no dressing is required, and the wound heals like a shaving cut. Malignant disease of the antrum rarely starts from the floor, and excision of the alveolus is unscientific. There is little or no disfigurement.

Raymond Verel.

Alles, Emmanuel C.—Mucocoele of the Anterior Ethmoidal Cells.
 "Lancet," December 14, 1912, p. 1645.

A case reported at the suggestion of Prof. Fuchs, of Vienna. A deaf and dumb man, aged twenty-five, presented himself at the eye clinic with right exophthalmos, persistent since scarlet fever at three years. A hard mass was felt at the junction of the upper and inner wall of the right orbit: firm and nodular, a small area at the upper part was softer and seemed to fluctuate. The swelling was fixed immovably to the bone. No pulsation, 2 cm. wide and 2 cm. long. Pressure at a certain spot caused shooting pain along right supra-orbital nerve. Eye-movements good. No diplopia. Eyeball completely covered on closing lids. Eye protruded 11 mm. Pupil normal and reacting to light and accommodation. Vision: R. $\frac{6}{36}$, L. $\frac{6}{9}$?, + 0.5 Hm. = $\frac{6}{9}$. Fundi normal. No epiphora. Right nasal blocking. Right middle turbinal hypertrophic and pressed to septum by large bulla of anterior ethmoidal cells. Pus in middle meatus. Left, old otitis media. Right ear, chronic adhesive otitis.

Diagnosis (Dr. Neumann): Chronic empyema of anterior ethmoidal cells secondary to tumour, probably cholesteatoma. *X-ray*: Tumour seemed to originate from right ethmoid and protrudes into upper part of maxillary sinus. Operation by Prof. Fuchs by external incision: brownish, semi-gelatinous fluid poured out of anterior ethmoidal cells. Anterior, middle and posterior cells curetted, also frontal sinus. Cavity plugged with gauze and wound partly closed. Patient died two days later. *Post-mortem*: Suppurative meningitis. Status thymolymphaticus. Thymus, 25 gm. The case is interesting from (1) rarity; (2) difficulty of diagnosis; (3) the disclosures made by the *post-mortem* examination.

Macleod Yearsley.

Iwanoff, A. (Moscow).—Fronto-ethmoidal Trepanation. "Zeitschr. f. Laryngol," Band v, heft 2.

Iwanoff holds that the frontal sinus is almost never diseased alone—that the ethmoidal cells or antrum (or both) are practically always affected. On the other hand the ethmoid may be diseased, while the frontal contains no pus. In only one of the 23 cases he has operated on was the frontal healthy, in the others it was diseased along with the ethmoid. All the cases had had intra-nasal treatment without effect. Iwanoff finds that he has less post-operative œdema if he injects cocaine along the line of incision. He removes the bone to which the trochlea is attached, and does not make a flap from the nasal mucosa. He opens the floor of the sinus first of all, and, if the cavity be small, he leaves the anterior wall *in situ* (four cases), but removes the mucous membrane. The author records one case in which the suppuration was confined to the posterior part of the sinus, and has

collected eight similar cases. After the radical operation on the antrum Iwanoff holds that the cavity again becomes lined with epithelium—partly from the mucosa which is left and partly from the flap turned down from the nose. After the radical frontal operation, on the other hand, the cavity fills with blood-clot, which organises into granulation-tissue and finally becomes a solid mass of bone. For this reason Riedel's operation is the ideal one, but is only suitable for cases in which the sinus is small. Iwanoff has operated on a case on which another surgeon had already performed the radical operation. The sinus was full of pus and granulation-tissue and was quite shut off from the nose. It is interesting to note that Iwanoff had to operate a third time in this case. This last operation was followed by hæmorrhage, which necessitated post-nasal plugging. This again was followed by suppurative otitis and mastoiditis. *Seven* of the 23 cases had to be operated on *three times*. Iwanoff tends to minimise the number and importance of the complications following operation, and suggests that in many cases these were present beforehand. The dangers of the operation are: (1) venous infection and osteomyelitis, and (2) meningitis from lymphatic injection. Iwanoff is against curetting the mucosa from the roof of the ethmoid, and favours the use of a drainage-tube instead of gauze packing. Iwanoff records one case in which operation was followed by erysipelas and pneumonia, and later by suppuration in the sterno-clavicular joint. With regard to the indications for operation the question has been asked: Is not the operation more dangerous than the disease? Hajek states that radical operation is indicated (1) in all cases of orbital and intracranial complication and those in which the bony walls are affected; (2) in chronic uncomplicated cases only when intra-nasal treatment fails to relieve profuse discharge and severe pain which prevent the patient working. Iwanoff agrees with Killian that long-continued conservative treatment has a bad effect on the mental outlook of the patient. Even in spite of removal of the middle turbinal and ethmoidal cells it is by no means always possible to pass the frontal cannula. Iwanoff wants to bring the indications for external operation on the frontal sinus into line with those for the radical mastoid, and would therefore include: (1) failure of conservative treatment to lessen purulent discharge, (2) recurrence of polypi in middle meatus. Of Iwanoff's 23 cases, 18 were cured; of the 5 others 3 were only a short time under treatment.

J. S. Fraser.

Luc (Paris).—My Present Technique in the Radical Treatment of Chronic Frontal Sinus Suppuration. "Zeits. f. Laryngol." Bd. iv, Heft 3.

Luc did his first external operation on the frontal sinus in 1893. After curetting he put in a rubber drainage-tube and subsequently washed out the sinus: a cure, however, was not obtained, and further operation was necessary. The author gives the history of his first four or five cases, in one or two of which he closed the external wound completely. In his first twenty cases he had, as a rule, trouble with drainage, the communication between the sinus and the nose being too narrow. In two cases brain abscess formed, in one osteomyelitis occurred, and in one case the patient died from meningitis. Since the communications of Taptas (1900) and of Killian (1902), Luc has completely altered his technique, and for five years he has never had any deaths from intra-cranial complication following operation. Since 1907 he has modified Killian's operation on the lines recommended by Jaques, of Nancy. He compares this new

operation to that recommended by himself upon the maxillary antrum; in other words, free removal of one wall of the sinus and curettage of the cavity through the opening so made. He removes the floor of the frontal sinus and thoroughly clears out the ethmoidal region, and so provides free drainage into the nose. He performs the operation, as a rule, under local anæsthesia, first introducing cocaine into the nose on mops in the usual way; he injects the line of incision with 1 per cent. novocaine and then passes the needle deeper down to the periosteum and region of the nasal nerve. Following Sieur, he opens the frontal sinus at the upper and inner angle of the orbit and investigates it with a probe. He does not remove the anterior wall nor does he follow up a large orbital extension if such exists, but removes freely the frontal processes of the superior maxilla. Before curetting the sinus he places a pledget of cotton-wool soaked in cocaine in the cavity and leaves it for five minutes; the curetting of the cavity is of course performed "blind." If the sinus is small the incision is entirely closed, but if it extends out to the external angle of the orbit Luc may put in a drain here for a short time. If the frontal extension of the sinus be high Luc performs Killian's operation, as we know it, making a vertical section incision if necessary in addition to the usual curved one. He cleans out the cavity with peroxide and then paints it with tincture of iodine, and finally insufflates iodoform powder, but puts in no packing. If all goes well the nose is not dressed for nine or ten days. If, however, pus appears in the nose he passes a curved cotton-tipped probe into the sinus and mops out the cavity with peroxide, and if the pus persists he washes out the sinus with saline. In this way he has operated upon ten cases since 1907. In all of these cases the antrum on the same side was affected. He operated on the antrum first, and then, at the same sitting, on the frontal. In three of the ten cases the frontal wound had to be reopened on account of retention of pus. In one of these the second operation took place three years after the first, and the cavity was found to be filled with connective tissue; the suppuration had only recurred in the infundibulum. In cases in which the bony wall of the cavity is definitely diseased the external wound should not be closed at the time of the operation. Luc confesses that, in omitting in many cases the removal of the anterior wall, he is thinking of the æsthetic result, especially in the case of young women.

J. S. Fraser.

LARYNX AND TRACHEA.

Legillon.—Abscess of the Larynx. "Arch. Internat. de Laryng." etc., September-October, 1911.

This may occur as a sequela to traumatism of the larynx of staphylococcic, streptococcic or pneumococcic origin, or it may occur secondarily to pre-existing laryngeal infections, tubercle, cancer, etc. At other times it arises from a direct spread of infection from the neighbouring parts, for example, in quinsy. Zymotic diseases are less frequently causes of this condition, if one excepts influenza, which is often accompanied by laryngeal involvement. The condition frequently goes on to abscess-formation, and is more common in adults. A predisposing cause is cold. The whole of the larynx may be affected, but particularly the lateral aspects. The disease is sometimes localised to the ventricular bands, the vocal cords and the sub-glottic region, but the ventricular bands are most frequently affected. Septic infiltration is more prominent in the laryngeal cellular tissue, the ary-epiglottic folds, epiglottis and

ventricular bands. When it occurs sub-glottically it may extend to the trachea. The mucous membrane is red or reddish-grey. Lesions of the cartilage are rare. Clinically the symptoms are objective and subjective. At the prodromal period there is general malaise and pain on swallowing, with moderate fever. Laryngoscopically at this period there may be only redness. When the condition is well established there is progressive dyspnoea, crises and suffocation going on actually to stenosis, dysphagia and lancinating pain referred to the larynx, with rapid alteration of the voice, which becomes rough and even aphonic. If the abscess bursts there is an escape of foetid pus and the condition clears up. At other times the pus evacuated from the abscess may penetrate the bronchi and set up septic pneumonia. Abscess of the larynx should be distinguished from acute oedema, erysipelas, tuberculosis, asthma, croup, stridulous laryngitis, cancer, polypi of the larynx and retropharyngeal abscess.

Treatment.—At first symptomatic to relieve the dyspnoea and dysphagia. Fomentations or ice-bags round the neck, and the local applications of cocaine and adrenalin for the dyspnoea. It may be necessary to incise the abscess. This should only be done under control of the vision. Tracheotomy should be reserved for serious cases where there are crises, suffocation or asphyxia.

J. D. Lithgow.

Hughes, W. Kent (Melbourne, Victoria).—**Infiltration of Laryngeal Mucosa: an Early Sign of Phthisis.** "Australian Med. Journ.," March 29, 1913.

The author is of opinion that the larynx can be infected by tubercle prior to, or apart from, the lung. The mucosa, which is devoid of cilia on the posterior wall of the larynx, is most prone to early infection. He is of opinion that all cases of pulmonary phthisis show some laryngeal involvement—healed or otherwise.

The earliest signs of tubercle in the larynx consist of slight to definite infiltration of the mucous membrane of the interarytenoid space.

A. J. Brady.

Jackson, Chevalier.—**The Dilatation of Bronchial Strictures.** "Journ. Amer. Med. Assoc.," September 21, 1912.

The chief causes of cicatricial bronchial stenosis are traumatism, syphilis and tuberculosis. The dilatation of a cicatricial stenosis may sometimes be required to secure adequate drainage of the infra-strictural bronchiecatic cavity and thus relieve the distressing symptoms.

Syphilitic strictures may sometimes require prolonged intubation with bronchial intubation tubes put in place with the aid of the bronchoscope, whereas tuberculous strictures seldom require local treatment because the tuberculous process is of such slow progress that the lung accommodates itself to the altered conditions. Traumatic cicatricial stenoses due to the prolonged sojourn of a foreign body in the bronchus are best treated by the Jackson divulsors, after which the foreign body may be reached and removed. Prolonged dilatation of the stricture after removal of the foreign body should be deferred until such after-dilatation is indicated by absence of improvement in symptoms, physical signs and radiographic signs after a number of months.

The method of dilatation by divulsion possesses the following advantages:

(1) It is safe because under the guidance of the eye and trained touch.

- (2) It does not require tracheotomy in any case.
- (3) There is no danger of pushing the foreign body downward.
- (4) It is much safer and simpler than tent dilatation or prolonged intubation, and better adapted to foreign body cases.

Birkett (Rogers).

Hughes, W. Kent.—**Notes on Four Cases of Foreign Body in the Trachea.** "Australian Med. Journ.," March 15, 1913.

(1) A child, aged three. A rabbit-bone could be seen in the larynx, below vocal cords, by means of the bronchoscope. X rays showed nothing. Bone removed through high tracheotomy wound. Recovery.

(2) Child, aged two. Piece of bone impacted below vocal cords. Removed with difficulty through high tracheotomy wound. Recovery.

(3) Child, aged four, swallowed a halfpenny six months before. X rays showed coin between œsophagus and trachea. (Esophagoscope showed granulations in the œsophagus about level of second dorsal vertebra. A large osteoplastic flap was turned up, the clavicle, first rib and manubrium sterni being cut through. The coin was found in a large abscess-cavity behind the œsophagus. The patient died seven days later, owing to sloughing of the flap and a sharp piece of bone having torn the pleural cavity.

(4) Child, aged eleven months. Dyspnoea after eating piece of bread. Collapsed on examination with bronchoscope. The trachea was opened with a single cut. A quarter of a plum-stone was jammed in the larynx. Foreign body removed through wound. Recovery. *A. J. Brady.*

Hunt, John G.—**Report of a Case of Aspiration of Silver Tracheotomy Cannula and Removal by Lower Bronchoscopy.** "Annals of Otol., Rhinol., and Laryngol.," vol. xxi, p. 355.

Female patient, aged thirty-six, who had worn a tracheal tube for six years. On withdrawing the cannula one day the collar became detached, so that the former receded into the trachea, and disappeared after a spasm and deep inspiratory movements. A skiagraph located it in the left lower quadrant of the heart shadow. The tracheal wound was enlarged under infiltration anaesthesia and the trachea cocaineised (20 per cent. solution). A 7 mm. Jackson bronchoscope was introduced and the cannula removed with ease, although the mucosa was already overlapping it from œdema. *Macleod Yearsley.*

THYROID GLAND.

Crane, J. W. (Wallacetown, Ont.).—**Graves's Disease.** "Canadian Practitioner," July, 1912.

MacDonald, W. J. (St. Catharine's, Ont.).—**Hyperthyroidism.** "Canadian Practitioner," August, 1912.

These two papers, dealing with the same subject and appearing in successive numbers of the same journal, may be noted together.

The first consists of the history of a series of four cases, in all of which tachycardia was the most prominent symptom, the pulses running all the way up from 100 to 160 per minute. Goitre was present in two on the right side, in the other two on both. Exophthalmia was absent in two of the cases, only moderate in the third, but very pronounced in the fourth. In all muscular tremors were marked. The last men-

tioned was the only case in which treatment proved unavailing. The other three were all benefited by a modified Weir-Mitchell treatment. In none of them was an operation deemed advisable.

The paper by Dr. MacDonald, a much more elaborate one, is introduced by drawing attention to the fact that hyperthyroidism, exophthalmic goitre, Parry's, Graves's and Basedow's are all identical diseases.

He lays particular stress upon the value of early diagnosis, and that tachycardia and tremor may point to the existence of the disease before goitre or exophthalmia are noticeable. In all cases thyroid change must have taken place, ushering in heart acceleration as the first symptom, the three other prominent symptoms coming on in varied order.

In connection with exophthalmos, the writer considers Stellwag's sign, staring without winking, as particularly important, as it is among the first to appear. The signs of Dalrymple, von Graefe and Möbius are also mentioned.

In speaking of the goitre, three distinct varieties are dwelt upon: (1) The small hard nodular gland; (2) the soft pulsating gland; (3) the simple goitre with changes in scattered areas. As to the aetiological factors of hyperthyroidism, what specially induces the extra secretion of the gland, whether it arises from without or within, are still unknown.

In treatment the writer considers medical methods to be on the whole unsatisfactory, and relief by surgical operation as especially desirable in properly selected cases. Wölfler's plan of ligation of the superior thyroid arteries is highly commended in cases in which the goitre and eye symptoms are not prominent. In these it may produce a permanent cure. Also, in long-standing cases, in which the patient is very ill, where heart changes have occurred, where the thyroid arteries present a thrill, and the condition of the patient is such as to forbid a more formidable operation, tying of the thyroids may promote comfort and prolong life.

In all other cases where surgery is demanded at all ablation of the gland becomes imperative. The seriousness of the operation the writer fully realises, and in connection therewith impresses upon the reader the importance of two things: the one, the absolute necessity of leaving the parathyroid bodies intact; the other, that all exophthalmic cases must be drained.

Price-Brown.

E.A.R.

White, Francis W.—*Myalgia with or without Otitis.* "Annals of Otol., Rhinol., and Laryngol.," vol. xxi, p. 346.

Deals with pain and tenderness about the sterno-mastoid, trapezius, and muscles about the ear. This myalgia may be due to faulty metabolism, rheumatic tendency, faulty innervation, blood conditions, cold, neurasthenia. The muscles involved may show tender areas on palpation. The author describes twelve cases in which a positive diagnosis of myalgia was made. Most of them appeared to be rheumatic.

MacLeod Yearshoy.

Frey, Hugo.—*The Physiological Importance of the Malleo-incudal Articulation.* "Archiv für die ges. Physiologie," Bd. cxxxix.

Fairly conclusive evidence is brought forward both on anatomical and physiological grounds that the malleo-incudal joint should be looked upon as a fixed one, and that Helmholtz was wrong in his theory that the bones interlocked and moved in unison only when the head of the hammer

rotated outwards, but allowed a slight play of movement between the ossicles when rotating in the opposite direction. The examination of this joint in a great many species of animals and almost all varieties of mammals has shown that in a great many with good hearing the joint is ankylosed. In order that the tympanic membrane may transmit its vibrations entire to the labyrinth it is necessary that the malleus and incus should act in complete unison without any loss of energy. The author demonstrates clearly by means of diagrams that Helmholtz erred in comparing the joint between the two ossicles to the lock-joint of a watch-key. Such a joint can only functionate properly when the axis of rotation passes through the middle of the joint in such a way that the teeth lie at opposite sides of its circumference, and not when it passes below both teeth as is the case in the joint in question. On this account the malleus and incus must move in unison, even apart from their anatomical connections, both on internal and external rotation. The contention that a movement between the ossicles is necessary as a protective arrangement in cases of sudden increase of the intra-tympanic pressure is disproved by the fact that in such cases the same pressure acts in a counter-direction on the foot-plate of the stapes; further protection to the labyrinth is afforded by the various intra-tympanic ligaments. As further evidence against Helmholtz's theory, it is pointed out that his experiments were conducted upon anatomical specimens, the integrity of which could not be verified, that the sounds employed to stimulate the parts were of abnormal intensity and sufficient in themselves to injure the very delicate structures under examination—at least sufficiently to hinder them from responding in a true physiological manner.

J. B. Horgan.

Yearsley, Macleod.—The Classification of Deaf Children "Brit. Journ. Child. Dis.," November, 1911, p. 481.

The author's scheme of classification includes "every child who shows any sign of loss of hearing, be it ever so great or ever so small." He divides deaf children into four groups—the slightly deaf, the semi-deaf, the very deaf, and the defective deaf. The slightly deaf he subdivides into (1) the very slightly deaf, which includes children who hear the whispered voice at a distance of not less than 3 ft., and (2) the hard of hearing, who hear spoken speech more than 4 ft. from the ear. The "very slightly deaf" need only be placed in the front desks of an ordinary hearing class, while for "the hard of hearing" Yearsley advocates the establishment of special classes held in hearing schools, but in charge of visiting teachers of the deaf. In the second group the semi-deaf are included in those whose acuity for spoken speech is 4 ft. or less, but who have more than vowel hearing or hearing for very loud speech close to the ear. These are divided into (1) better cases and (2) worse cases. The former include those of good mentality, fair residual hearing, and natural or residual speech, and should be taught as permanent units of special classes under teachers of the deaf. The "worst cases" of the semi-deaf and the next group—the very deaf—must be educated in a special school for the deaf, where, after each child has received individual study, reclassification can take place so that those showing progress under the oral system may have every chance of developing by that method, while those who are proved failures at oralism may, as soon as possible, be in a sense segregated and taught by the manual system. A third group, lying between these two extremes, may take advantage of both systems. Mr.

Yearsley emphasises and re-emphasises the vital importance of close individual study of each child so that he may, by proper placing, be developed along the lines most suited to his hearing and mental powers.

The last division—the defective deaf (blind or mentally defective)—is not discussed beyond an expression of strong approval of a proposal to place this class under segregation and permanently to care for them.

Author's abstract.

MISCELLANEOUS.

Freudenthal, Wolff.—Second Report on the Therapeutic Value of Radium in Malignant Tumours of the Upper Air-tract. "Annals of Otol., Rhinol., and Laryngol.," vol. xxi, p. 334.

The author gives a short account of the further history of ten cases described in the first report (*Annals of Otology*, March, 1911, abstracted *JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY*, vol. xxvi, p. 611), and gives a further twelve cases. Three of the former ten cases are still without recurrence and in good health, and two of the new ones are "so much improved that they might be pronounced cured."

Macleod Yearsley.

Joachim, O.—Non-Poisonous Anæsthesia of Mucous Membranes. "New Orleans Med. and Surg. Journ.," October, 1912.

In order to avoid the risks of general anæsthesia the author strongly recommends that operations on the nasal passages, pharynx, etc., should be done under local anæsthesia. The best drugs for this purpose are alypin, and novocaine combined with adrenalin. Novocaine possesses only one tenth and alypin only one fourth the toxicity of cocaine and, moreover, solutions of the two former drugs may be sterilised by boiling without destruction of any of their properties. The solutions recommended are (1) 20 per cent. solution of alypin to which is added one fifth in volume of 1:1000 adrenalin solution. (2) Four drachms of 2 per cent. novocaine solution to which is added fifteen drops 1:1000 adrenalin solution.

The solutions require a delay of six to eight minutes after injection before commencing to operate. The injection should be made whenever possible into and around the nerve-trunk supplying the part.

The Caldwell-Luc operation, operations on the frontal sinus, and even mastoid operations may be undertaken with this method of local anæsthesia.

Knowles Renshaw.

REVIEWS.

De l'Enrouement chez les Chanteurs (Hoarseness in Singers). By Dr. HENRI LAVIELLE (Bordeaux). Pp. 122. Bordeaux: Imprimerie Moderne, A. Destout, Aîné & Cie., 1912.

In this brochure the writer commences with a consideration of the normal singing voice, and particularly the anatomy and physiology of the organs concerned, so far as necessary for an understanding of their action in singing. In general his account of the matter is in accordance with the views of the best recognised authorities, and most notably Prof.

Moure, of Bordeaux, who has written so well on "the abuse of the voice in speaking and singing." Very wisely he makes the statement (p. 45) that "the giving out of air is the most important part of the respiratory act, for if the singer ought to educate his respiratory bellows thoroughly, it is more for the purpose of helping him to know how to distribute the air with perfect precision rather than simply to take in as large a volume of it as possible." In view of this the author declares himself an uncompromising partisan of the abdominal or diaphragmatic type, which he very definitely prefers to the lateral costal. His account of the registers is very intelligible, and he claims to be the first to give the proper insistence upon the action of the lateral crico-arytenoid muscles in the closure of the posterior part of the glottis (p. 46). One very interesting question which he attacks is as to whether from the physical signs the laryngologist is able to classify a voice, and he admits that an affirmative answer is only a relative one, and that as much as the specialist can do, as a rule, is to be able to tell the singer about the anatomy of his phonetic apparatus, as, for instance, whether he has long cords, and should, therefore, avoid straining on high notes, or that he has very slender cords, with which, therefore, he should not endeavour to strain after great volume (p. 53). The causes of hoarseness in singers are in many instances extremely obvious, as, for instance, climate and occupation. Certain substances he considers act as veritable poisons for the voice, such as cocaine, and in a degree also, iodine and sulphur, as also arsenic (p. 72). He warns his readers against accepting as pathological the changes in the voice which occur at puberty, it being only necessary to give the vocal organ a rest during this period of life (p. 75). Among the pathological causes are general and constitutional conditions—diseases of the ear and those of the vocal apparatus, including those affecting (*a*) the bellows, (*b*) the vibrator, (*c*) the resonators (p. 76). The most interesting are, however, the professional causes, such as errors in classifying the voice, defective breathing, wrong methods of attack and of sustaining the sound, *poitrineage* (pushing the thick or chest register too high) (p. 94). The cases illustrating these various causes will be found instructive reading.

In his conclusions he insists that the chief cause of hoarseness in singers is abuse of the voice, the treatment being both curative and preventive, the former, medico-surgical or physiological, including re-education of the voice, and the latter, vocal hygiene and physiological culture. The work throughout is clearly written, and while sufficiently elaborate to remove the charge of dryness, is not unnecessarily amplified, and is a very good example of what it calls itself—"a physio-pathological study of the singing voice."

Dundas Grant.

Verletzungen des Ohres bei Katastrophalen Explosionen. Von Dr. IGNAZ HOFFER und Dr. OSKAR MAUTHNER. Wien: Joseph Sofar, 1913.

This account is based on the examination of 130 people injured by the explosion of about 150,000 kgm. of powder which occurred in the Steinfeld close to Vienna on June 7, 1912.

An introduction of twenty-four pages is devoted to the consideration of explosive bodies and their effects in general, followed by a survey of otological literature on the subject. Then comes a description of this particular explosion, first as regards its effect on inanimate objects, and secondly, with reference to the aural lesions of the wounded who survived the catastrophe. Of these, 5, who were within 25 to 200 paces of the explosion, form a group by themselves, all of whom had some affection of

the labyrinth, and two a rupture of the tympanic membrane with consecutive suppurative of the middle ear and functional disturbances of varying degrees persisting for over a month, at which time a re-examination was made. Of the remainder, 105 suffered various transient affections and 22 apparently altogether escaped any ear injury. A detailed account is given of all the more important cases.

The authors' conclusions are summarised under twelve heads: (1) Injuries of the ears due to the explosion of large masses of explosives are to be referred to the suddenness and intensity of the explosion. (2) The most common condition which obtains in an explosion is a primary positive impulse followed by a secondary negative effect. (3) The effect of an explosion decreases in its intensity as it recedes from the site of origin. (4) The lesions of the ears do not vary directly with the relative position of patient and site of explosion. (5) The peculiar construction of the external auditory meatus influences the effects of the force. (6) In this particular explosion the danger zone should have reached some 3000 metres according to the formula " $d = m \sqrt{P}$ " (where d represents the distance, P the amount of explosive and m its constant explosive value). No damage to the ears, however, occurred on this occasion beyond 1500 metres. (7) The fatal and severely injured cases all occurred within 200 metres in this instance. (8) Beyond this came a second group in whom the aural lesions were mostly slight and transient in character. (9) The most marked effect on the hearing was a depreciation of the upper tone limit. (10) The injuries of the inner ear cannot be ascribed to sound effect. (11) There is no evidence to show that a zone existed close to the site of the explosion within which the sound of the explosion was not appreciated. (12) It is important to recognise the psychical after-effects, which are to be regarded as due to the result of shock.

These conclusions, of which the above is only a short abstract, may serve to illustrate the somewhat laboured attempt at specialisation dominating the style and character of the treatise. The chief value of the book would appear to be forensic, and from this point of view it is disappointing that the report was not held over till the after-history of the more severe cases could have been completed. *Alex. R. Tweedie.*

Sclero-Corneal Trephining in the Operative Treatment of Glaucoma. By R. H. ELLIOT, M.D., B.S.Lond., Sc.D.Edin. F.R.C.S.Eng., etc., Lieut.-Colonel I.M.S., Superintendent of the Government Ophthalmic Hospital, Madras, Professor of Ophthalmology in the Medical College, Madras, and Fellow of the University of Madras, S. India. The Ophthalmoscope Press, 1913. Price 7s. 6d. net.

At the annual meeting of the British Medical Association in Birmingham, 1911, Colonel Elliot's contribution on the subject which he has made his own, was that of an enthusiast; he has now presented his ideas, results and deductions in book form, and so clearly that they are a distinct addition to the ophthalmologist's library. They are worthy of consideration by those who, whilst not actually in agreement with Colonel Elliot on the exact mode of procedure of operating for glaucoma, still are seeking for a remedy from this fell disease. The book is dedicated to that Nestor of ophthalmic surgeons, Priestley Smith, whose name ever recurs to the mind when dwelling on the dread malady yelet glaucoma.

Elliot accepts the maxim of Herbert and Lagrange, that the relief of glaucomatous tension is to be found in establishing a permanent filtering passage between the anterior chamber and the subconjunctival space, in

preference to the classical iridectomy performed by v. Graefe half a century ago.

There is a chapter by Sydney Stephenson and A. J. Ballantine giving an historical account of trephining for glaucoma, and an interesting account of the more recent operations.

In giving the indications for sclero-corneal trephining the author mentions, *inter alia*, glaucoma secondary to cataract, in connection with which he states that judging from the literature on the subject, one gathers that this form of glaucoma is comparatively rare in European countries; it is, however, all too common in India.

The description of the method of preparation for, and of the operation itself, disclose the writing of a practical man and not that of a mere theorist.

It is to be noticed that "atropine" is instilled on the third day after operation, unless the pupil is already widely dilated, as the author finds "in congestive cases a strong tendency to the formation of posterior synechiæ; the quiet iritis which leads to this exudation gives no other evidence of its occurrence."

Though Freeland Fergus's method of trephining is described in the chapter by Temple Smith, on the site of trephining, we do not notice any mention of it in that by the author himself on modifications of operative technique suggested by other surgeons.

The author has been fortunate in his cases where complicated by dislocation of the trephine disc into the anterior chamber, and his results should be an encouragement to those surgeons who fear post-operative irido-cyclitis from this complication.

We notice that the author prefers instrumental means of measuring tension to the time-honoured procedure with fingers, which must appeal to the scientific mind as the only means of eliminating the personal element, and that the Ophthalmic Hospital, Madras, is equipped with no less than five ophthalmotonometers.

H. H. B. Cunningham.

BOOKS RECEIVED.

Analytical Tables of the Anatomy and Physiology of the Fifth Cranial or Trigeminal Nerve, and of its Ganglia and Connections, etc. By L. Hemington Pegler, M.D., M.R.C.S. London: Baillière, Tindall & Cox, 1913.

Compendium of the Pharmacopœias and Formularies (Official and Unofficial). By C. J. S. Thompson. Fourth Edition. London: John Bale, Sons & Danielsson, Ltd., N.D.

Principes d'Anacusie (Ré-éducation Auditive). By A. Zund-Burquet. Préface du Prof. M. C. Gariel. Paris: A. Maloine. Editeur, 1913.

Die Untersuchung der Luftwege. Von Dr. P. H. Gerber, A. O. Professor und Direktor der Königlichen Universitätspoliklinik für Hals- und Nasenkrankheiten zu Königsberg i. Pr. Würzburg: Curt Kabitsch, 1913. Preis M. 3.

THE

JOURNAL OF LARYNGOLOGY,
RHINOLOGY AND OTOTOLOGY.

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THE INTERNATIONAL CONGRESS, LONDON, THROUGH
FOREIGN SPECTACLES.

It is with much pleasure that we are able to report that the pains-taking arrangements made by the officers and councils of the Sections of Laryngology and Otology at the recent International Congress seem to have been crowned with almost perfect success, if we may judge from the flattering accounts which have appeared in many of our foreign contemporaries.

The following extracts speak for themselves:

Prof. Finder, in *Semon's Centralblatt für Laryngologie*, after an admiring tribute to the perfect organisation of the Congress as a whole, writes:

"That the proceedings [in the special Section] ran such a harmonious course, undisturbed as they were by a single jarring note, and that it was possible to carry to completion the whole of the extensive programme of work, was largely due to the President of the Section, Sir StClair Thomson. His fine tact, his urbane courtesy, and the never-failing charm of his address, whether he spoke in English, in French, in German, or in Italian, made his chairmanship a real æsthetic delight."

Regarding the social entertainments the same eloquent writer says: "Every function was delightfully thought out to the finest detail and arranged in the most perfect manner. Everything bore the impress of that genuine worth and distinction which an old and select culture alone can bestow, and what is of more value, we received the pleasant impression that everything was offered to us in the true spirit of kindly hospitality, and that the giving gave real pleasure to the givers."

Prof. Moure, in the *Revue Hebdomadaire de Laryngologie*, says:

"Our English *confrères* were hospitable without stint, and they may con-

gratulate themselves upon having satisfied the most captious. Every member of the Congress has carried away from London a most delightful and enduring memory."

In *Le Larynx* the writer on the Congress remarks, *inter alia*, that—

"The Sections of Otology and Rhino-Laryngology may defy, in many respects, the most exacting criticisms. . . . No communication was made the pretext for rowdy demonstrations, and throughout the whole course of the meetings law and order held continual sway. For this we are indebted to the brilliant presidencies of Sir StClair Thomson and Mr. A. Cheatele."

It will be deeply gratifying to the officials and councils of the two Sections to hear their work and its results so highly praised. But we must not allow ourselves, in the midst of these landatory pæans, to ignore the still small voice of criticism, particularly as it may be of benefit to future congress arrangements to discuss one or two of the critical points that have been raised.

Perhaps the most unexpected of these is an objection—very kindly expressed, be it said—which has been made to the maintenance of the division of otology and rhino-laryngology in two separate sections—an objection which seems to have sprung from the impossibility of any congressist, unlike Sir Boyle Roche's famous bird, being in two different places at the one time. But it may truly be said that any attempt to combine the two Sections into one at the London Congress would only have ended in confusion and disaster. Future congresses, no doubt, will decide the question in their own way, but on this occasion the variety and amount of work necessarily included in both of the sectional programmes could only have been accomplished by the two sections sitting separate. At the same time it should be remembered that the vast majority of specialists have a foot in either camp, and are, indeed, never quite happy in the one because of the fear that they may be missing something of interest in the other. Perhaps at future Congresses arrangements might be made to alternate the *séances* of the two Sections, although even this proposal, if carried into effect, would not be altogether free from difficulty.

More to the point is the regret that all the "rapports" were not in the hands of the members prior to the debates. For this deficiency, however, the "rapporteurs" were themselves partly responsible, inasmuch as many of them had delayed sending in their "rapports" until too late. The other party to the omission was the Central Committee of the Congress, which found itself unable to vote the funds necessary for this purpose.

The many social events seem to have left with our visitors

nothing but pleasant memories, as there is no sign of the awful shadow of the *Katzenjammer* in any of the accounts we have read.

On the whole, then, we may say that the executive officers and councils can look back upon their prolonged and anxious labours with considerable satisfaction.

With regard to the proceedings of the Sections, we hope at an early date to proceed to their publication in abstract in the columns of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

CEREBRO-SPINAL RHINORRHOEA WITH SUBSEQUENT ETHMOIDITIS AND FRONTAL SINUS SUPPURATION.

BY P. WATSON-WILLIAMS, M.D.,
Bristol.

THE case here described and illustrated is probably an exceedingly rare instance of cerebro-spinal rhinorrhœa, complicated by an intercurrent of pansinusitis, and affords an example of an unforeseen contingency which led to a fatal result following a frontal sinus operation. It will be observed that the cerebro-spinal rhinorrhœa was diagnosed by inference, but the author feels that the evidence for its existence is sufficiently complete to make it a fair presumption.

S. H.—, male, aged forty-two, plasterer, was admitted to my ward at the Royal Infirmary, January 22, 1913. He had complained of double vision for about four months, but for nearly five years had complained that his sight was "curious." For two years was liable to walk sideways, and for about two years had noticed a swelling in the upper internal angle of the right orbit. He had suffered from recurrent headache for many years, but much more severely for the previous two weeks, chiefly vertical, and once, a day or two before admission, he had vomited. Temperature 99° F., pulse 84. Both nasal passages were completely occluded by œdematous polypus but no purulent discharge was seen. The right eye was displaced downwards and outwards, there was definite exophthalmos and movements were somewhat restricted. Pupils reacted normally to light. The swelling at the inner angle of the orbit was soft and fluctuating. On the day of admission there was a copious clear watery discharge from the nose for about an hour and a half and the orbital swelling almost disappeared. He states that this had occurred on several occasions before. The diplopia, proptosis, and displacement of the bulb very much decreased, also the headache.

January 26: The orbital swelling is returning, together with recurrence of bulbar displacement, double vision and headache. On January 24 his temperature rose to 99·8° F. owing to a small furuncle in the right auditory meatus, but it had remained subnormal since that day. The patient's general condition very satisfactory, able to be about and to get out in the garden.

The diagnosis was nasal polypus with consequent occlusion of ethmoid cells, and as a result of distension an ethmoidal mucocele was supposed to have arisen,

emptying itself at intervals, the outer bony wall being absorbed. There was none of the usual signs suggestive of frontal sinus suppuration.

Operation, February 5, under general anæsthesia: The maxillary antra were first explored by the author's exploratory suction syringe, muco-pus being withdrawn from both. The polypi were removed from the nose and a double intra-nasal antral operation performed, numerous large polypi being removed from the antral cavities. It was noticed that as soon as the polypi were removed from the right middle meatus the external orbital swelling collapsed. With a view to opening up the orbito-ethmoidal cells, a curved incision was made down to the periosteum, and the periosteum raised from the bone on the inner orbital wall and roof. A gush of pus followed, and on further extending the incision along the lower margin of the hairy eyebrow a fistulous opening in the floor of the frontal sinus was found. The right frontal sinus, which extended upwards for $1\frac{1}{2}$ in. and



FIG 1.

internally beyond the middle line, communicated with the left frontal sinus through the septum. The frontal sinuses were thrown into one by a Killian operation on the right side, a very free communication being made into the left nasal passage by enlarging the left fronto-nasal passage, by complete removal of the left fronto-ethmoidal cells of the frontal septum and of the upper half inch of the corresponding portion of the nasal septum. But before this, a remarkable feature in the inner orbital wall was noted, viz. that the dura mater was exposed by a dehiscence or absorption of the bone over an area of about $\frac{3}{4}$ by $\frac{1}{2}$ in., corresponding to the region indicated in the drawing (Fig. 2, 2) as a dark patch. The dura pulsated and care was taken to avoid wounding it, and as far as possible the whole operated area was made aseptic before closing the wound externally.

February 6: Temperature rose to 102° F. Patient vomited several times. Tube removed.

February 7: Temperature rose to 103.4° F.; vomiting.

February 8: The patient morose but mentally quite clear. The wound looking healthy and healing rapidly.

He became rapidly worse at 2 a.m. on February 9, and died at 3.25 a.m.

The *post-mortem* examination showed that the patient had died of acute meningitis, and that this was obviously due to infection through a very small anatomical communication through the dura mater near the inner border of the area of dura mater exposed at the time of the operation. This suggested that the patient must have had cerebro-spinal rhinorrhœa. Inquiries from his brother seemed to confirm this view, as he stated that the patient had recurring headaches from boyhood, that from the age of sixteen he used to suffer from peculiar colds with dripping of clear water lasting for days. Probably he had had cerebro-spinal rhinorrhœa, then having developed antral suppuration with subsequent formation of nasal

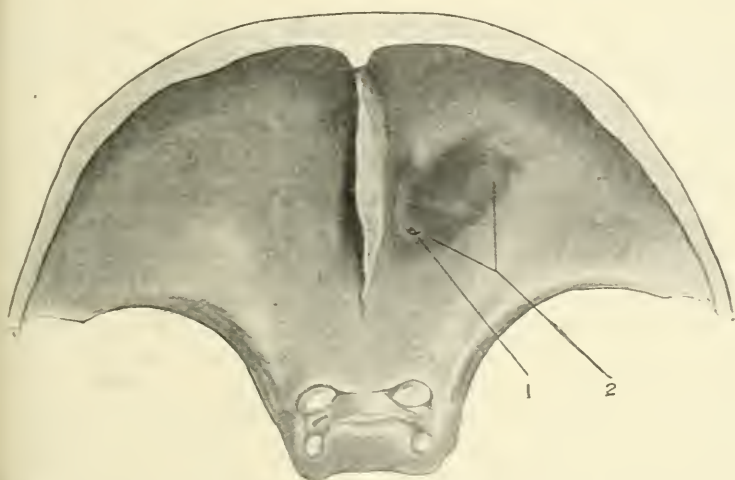


FIG. 2.—1, corresponds to ostium in the dura mater; 2, corresponds to dura mater exposed by disease.

polypus and also frontal sinus suppuration, the escape of cerebro-spinal fluid from the ostium in the dura mater down the nasal passage became obstructed by the growing nasal polypus. Consequently it formed an external swelling with bulbar displacement, and every now and again the collection of cerebro-spinal fluid ruptured itself through the nose.

The misfortune of such a condition occurring in association with frontal sinus suppuration must be exceedingly rare, but infection through the open portal leading directly to the subarachnoid space was inevitable, and I regret very much that the possibility of the patient having cerebro-spinal rhinorrhœa had not occurred to me, and, therefore, that no means were taken to examine the escaping fluid with that in view.

TOXIC EXHAUSTIVE INSANITY ASSOCIATED WITH CHRONIC SUPPURATIVE OTITIS MEDIA, LABYRINTHITIS, AND EXTRA-DURAL ABSCESS.

By D. K. HENDERSON, M.D.,

Resident Physician, Phipps Psychiatry Clinic, Johns Hopkins Hospital, Baltimore
late Assistant Physician, Royal Edinburgh Asylum; and

WINIFRED MUIRHEAD, L.R.C.P.Ed.,

Late Pathologist, Royal Edinburgh Asylum; and

J. S. FRASER, M.B., F.R.C.S.,

Assistant Surgeon, Ear and Throat Department, Royal Infirmary, Edinburgh;
Aural Surgeon, Leith Hospital.

THE writers are indebted to Dr. George M. Robertson, Physician-Superintendent Royal Asylum, Edinburgh, for permission to record the following case:

W. P.—, male, aged forty-two, labourer, married, was admitted to the Royal Edinburgh Asylum, Morningside, on May 29, 1912.

The history of the development of the case obtained from the patient's wife was unsatisfactory, as she was of very low-grade mentality, and had not been especially observant. She stated, however, that the patient had always been a quiet, hard-working man, and had earned fifteen shillings per week as a worker in a flock mill. They had no children, and the informant denied ever having had any miscarriages. Six weeks previous to his admission to the Royal Edinburgh Asylum the patient had to give up work owing to a failure of his general physical health, and the doctor who attended him said that he was suffering from consumption. Gradually he became dull and apathetic, lay in bed all day long, had a very poor appetite, and *became too weak to walk*. No account could be got at this time in regard to the onset of a muco-purulent discharge from his left ear. Owing to his poor physical condition he was sent to Seafield Hospital, Leith, but after a few days' residence there he was transferred to the Royal Edinburgh Asylum on account of irritable, irrational behaviour.

On admission to the Royal Edinburgh Asylum (May 29, 1912) he was in a dull, confused, irritable, dishevelled condition. He absolutely refused to co-operate in a mental examination, usually refused to answer any question at all, or else when he did so replied in a flippant, irrelevant way.

He seemed to realise that he was in a hospital, but owing to his attitude it was impossible to form any estimate of his memory or orientation. No delusions or hallucinations could be demonstrated at that time.

Physically.—He was a white-faced, poorly nourished, degenerate man. Pulse 72 per minute; temperature 96.2° F.

He complained of *headache and dizziness*, showed a tendency to *fall backward* unless supported, and when supported walked dragging the left foot, but the left arm was dependent and not in wing position as is seen in complete hemiplegia.

The pupils were equal and regular; the reaction to light and accommodation could not be determined owing to lack of co-operation. There was no paralysis of the external eye muscles, and no nystagmus.

He had a *purulent discharge from the left external auditory meatus*. The

hearing could not be definitely determined, again owing to lack of co-operation, but it was not grossly disordered. There was no disorder of the other cranial nerves, no special tremors, and no disturbance of speech. The tendon reflexes were exaggerated on both sides, but rather more so on the left. There was no ankle clonus and no sign of Babinski on either side. He showed numerous brownish scars on both legs, which seemed to be of a syphilitic nature, but both he and his wife subsequently denied any syphilitic infection.

During the week following his admission he continued to exhibit much the same condition. Gradually, however, under local treatment the ear condition began to improve, and his general physical and mental condition became so much better that on June 18, 1912, he was noted as co-operating much better than at any time previously.

He now answered all questions correctly, had a good appreciation of time, place, and person, and was able to give a fair account of his life. He realised that he had passed through an acute mental disturbance. He was now able to be up and about the ward, assisted in some of the simple ward work, and did not show any special abnormality of gait.

The examination of his cerebro-spinal fluid showed a negative cell count of two cells per c.mm., negative globulin reaction, and negative Wassermann reaction both with the cerebro-spinal fluid and blood-serum. A qualitative examination of the cell-content of the cerebro-spinal fluid by means of Alzheimer's method showed lymphocytes, 62 per cent.; large mononuclear cells, 37 per cent.; polymorphonuclear leucocytes, 1 per cent. No plasma, gitter, or macrophage cells were seen.

The patient continued to behave in a quiet way, and seemed to have recovered from his mental condition, but on July 12—three days before death—he had a relapse and suddenly became confused and irritable. He tore his bed-clothes, struck another patient without any provocation, either refused to answer any questions or else answered them irrelevantly, and at nights was exceedingly restless and noisy. This condition lasted until the time of his death on July 15, 1912.

Remarks.—Clinically, the explanation of such a case was exceedingly difficult. Owing to the old syphilitic (?) scars on the patient's legs, and the fact that he dragged his left leg in walking, it was thought that he might have some syphilitic affection of his nervous system. The entirely negative findings in the cerebro-spinal fluid and blood-serum made one feel justified, however, in absolutely ruling out such a diagnosis.

The clearing up of the ear symptoms under local treatment and the negative cerebro-spinal fluid findings also seemed to conclusively rule out any cerebral or cerebellar involvement due to abscess formation, so one was forced to make the more or less symptomatic diagnosis of a confused, irritable mental state developing on the basis of a low state of nutrition. The pathological and detailed examination of the left ear were, however, instrumental in throwing more light on the case.

Autopsy Report.—The autopsy showed a poorly nourished man with brownish scars on both legs. There was marked thickening of the left mastoid process, and pus was seen in the left auditory meatus.

Heart: Weight, 10 oz. The heart muscle was pale and friable and showed some fatty infiltration. The tricuspid valve showed an *acute endocarditis* with, in addition, small inflammatory hæmorrhages on the cusps; the pulmonary cusps were acutely inflamed; the mitral valve showed some chronic endocarditis; the aortic valve showed no abnormality.

Respiratory System.—Left lung: Weight, 16½ oz. This lung was emphysematous throughout. There was no tubercular focus and no congestion.

Right lung: Weight, 25 oz. This lung showed an acute venous congestion of the lower and middle lobes, but there was no actual consolidation. There was no evidence of any tubercular process.

The kidneys, liver and spleen all showed a slight degree of chronic congestion.

Nervous System.—The outer surface of the dura mater was greatly thickened over the roof and posterior surface of the left inner ear and infiltrated with pus. The pia arachnoid was slightly thickened. The brain weighed 42½ oz and presented no gross abnormality in the way of atrophy of the convolutions, foci of softening, etc. There were no granulations in the floor of the fourth ventricle. There was no evidence of any abscess formation in either the cerebrum or cerebellum, and on section of the brain no focus of infection was found.

Sections were taken from the frontal, precentral, parietal, occipital and temporo-sphenoidal regions. On microscopic examination the nerve-cells were found to be swollen and showed a fairly diffuse chromatolysis, but they did not seem to be decreased in number and their layering was not disordered. In the large Betz cells in the motor region the nucleus stained darkly and a moderate degree of axonal reaction was seen. There was no proliferation of the neuroglia, and no new vessel formation.

Remarks.—In the light of the above findings it seems reasonable to suppose that the sudden relapse of the patient was due to an acute extension of the toxic process in the left ear, setting up an acute endocarditis and secondary congestive processes in the lungs, kidneys, liver, and spleen. A pure culture of *Streptococcus pyogenes* was obtained from the right lung, and it was unfortunate that cultures were not also obtained from the heart and ear.

The nerve-cell changes seen in the cortex were quite typical of those obtained in acute toxic-exhaustive states.

D. K. H.

W. M.

EXAMINATION OF THE LEFT TEMPORAL BONE AND LEFT MIDDLE AND INNER EAR.

[For purposes of comparison photo-micrographs, made from sections obtained from the normal right ear of another patient are reproduced alongside of those showing the condition of the diseased left ear of the present case, W. P.—. The photo-micrographs are made from the two ears at more or less corresponding points. All the sections are cut vertically from before

PLATE I.



FIG. 1.—Normal right ear. No. 97.

tensor tympani.
 spiral coil of cochlea.
 middle coil.
 cochlear nerve in internal meatus.
 cranial end of aqueduct of cochlea (perilymph).
 lower part of basal coil of cochlea.
 carotid canal.
 tubal portion of tympanic cavity.



FIG. 2.—Normal right ear. No. 127.

tensor tympani.
 dicotremata.
 canal for great superficial petrosal nerve.
 modiolus.
 facial nerve.
 cochlear aqueduct.
 site of junction of lamellar bone of carotid canal
 with cartilage bone of cochlear capsule.
 carotid canal.
 basal air cells.
 tubal part of tympanic cavity.

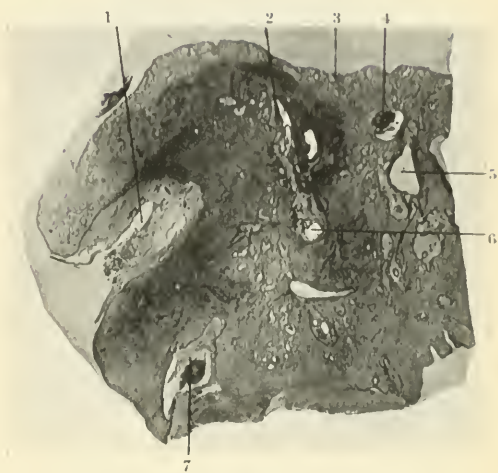


FIG. 1A.—Diseased left ear. No. 80.

1. Internal meatus with thickened dural lining.
 2. Upper part of basal coil of cochlea filled with new fibrous
 tissue and bone.
 3. Floor of middle fossa.
 4. Tensor tympani.
 5. Tubal portion of tympanic cavity greatly narrowed.
 6. Lower part of basal coil with dilated cochlear duct.
 7. Fibrous thickening of lining membrane of cochlear
 aqueduct.



FIG. 2A.—Diseased left ear. No. 150.

1. Facial nerve. The cochlear nerve below and to the
 right is incorporated in the vascular fibrous tissue
 filling the meatus.
 2. Modiolus.
 3. Middle coil of cochlea.
 4. Tensor tympani.
 5. Tubal part of tympanum greatly narrowed by new
 formation of bone and fibrous tissue.
 6. Carotid canal.
 7. Basal coil of cochlea replaced by new bone.
 8. Jugular bulb.
 9. Aqueduct of cochlea.

PLATE II.

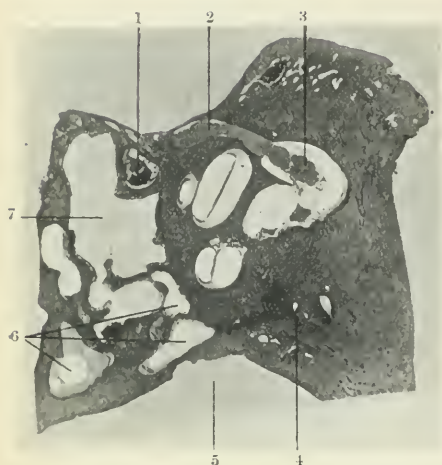


FIG. 3.—Normal right ear. No. 175.

1. Tensor tympani.
2. Facial nerve passing above cochlea.
3. Vestibular ganglion.
4. Cochlear or perilymphatic aqueduct.
5. Jugular bulb.
6. Air-cells in floor of tympanic cavity.
7. Tympanic cavity.

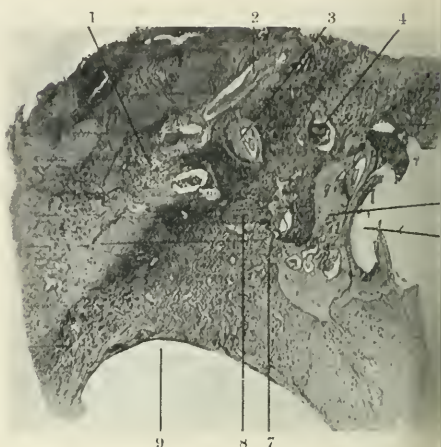


FIG. 3A.—Diseased left ear. No. 275.

1. Internal meatus almost obliterated.
2. Facial nerve.
3. Middle coil of cochlea almost filled with new fibrous tissue.
4. Tensor tympani.
5. Thickened submucous tissue filling tympanum.
6. External meatus.
7. Region of old fistula from tympanum into basal coil.
8. Scala tympani of basal coil filled with new bone.
9. Jugular bulb.

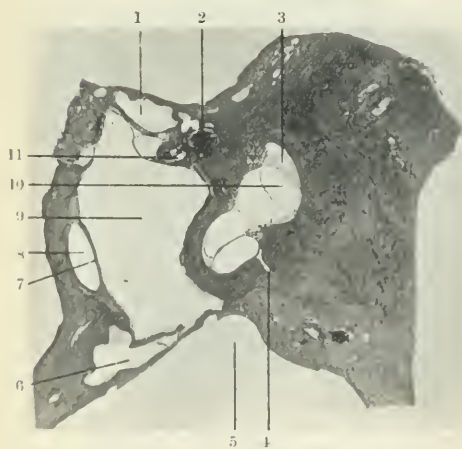


FIG. 4.—Normal right ear. No. 244.

1. Anterior part of epitympanic cavity.
2. Facial nerve.
3. Anterior part of utricle.
4. Cochlear opening of perilymphatic duct.
5. Jugular bulb.
6. Tympanic air-cell.
7. Tympanic membrane.
8. External meatus.
9. Tympanic cavity.
10. Sacculus.
11. Tensor tympani.



FIG. 4A.—Diseased left ear. No. 295.

1. Geniculate ganglion in contact with the extradural abscess.
2. Tympanic membrane adherent to inner wall of tympanum.
3. Fistula into basal coil of cochlea.
4. Cochlear opening of perilymphatic aqueduct filled with new bone.

PLATE III.



Fig. 5.—Normal right ear. No. 295.

- 1. Head of malleus.
- 2. Head of malleus.
- 3. Head of malleus.
- 4. Head of malleus.
- 5. Head of malleus.
- 6. Head of malleus.
- 7. Head of malleus.
- 8. Head of malleus.
- 9. Head of malleus.
- 10. Head of malleus.
- 11. Head of malleus.
- 12. Head of malleus.
- 13. Head of malleus.
- 14. Head of malleus.



Fig. 6.—Normal right ear. No. 352.

- 1. Head of malleus.
- 2. Head of malleus.
- 3. Head of malleus.
- 4. Head of malleus.
- 5. Head of malleus.
- 6. Head of malleus.
- 7. Head of malleus.
- 8. Head of malleus.
- 9. Head of malleus.
- 10. Head of malleus.



Fig. 5A.—Diseased left ear. No. 390.

- 1. Extradural abscess in region where middle and posterior cranial fossae join.
- 2. Vestibule filled with new fibrous tissue.
- 3. Foot plate of stapes.
- 4. Facial nerve.
- 5. Tensor tympani.
- 6. Handle of malleus.
- 7. External meatus.
- 8. Promontory.
- 9. Niche of round window filled with thickened mucosa; note new bone in vestibule above round window.
- 10. Ampullary end of posterior canal.
- 11. Jugular bulb.

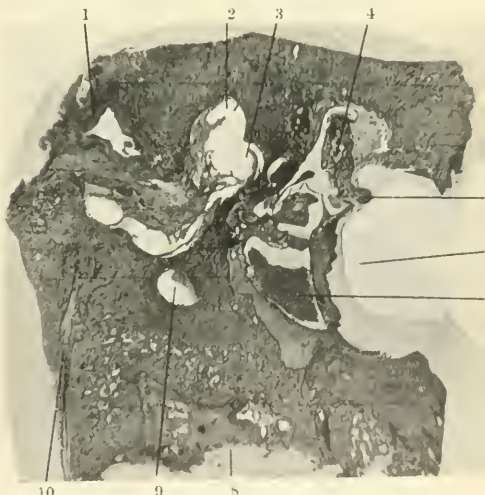


Fig. 6A.—Diseased left ear. No. 445.

- 1. Extradural abscess in connection with fistula from posterior part of vestibule.
- 2. Superior canal.
- 3. External canal.
- 4. Head of malleus (eroded).
- 5. Short process of malleus.
- 6. External meatus.
- 7. Granular exudate in tympanic cavity.
- 8. Jugular bulb with fibrous thickening (old thrombosis?) in roof.
- 9. Posterior canal.
- 10. Aqueduct of vestibule.

PLATE IV.

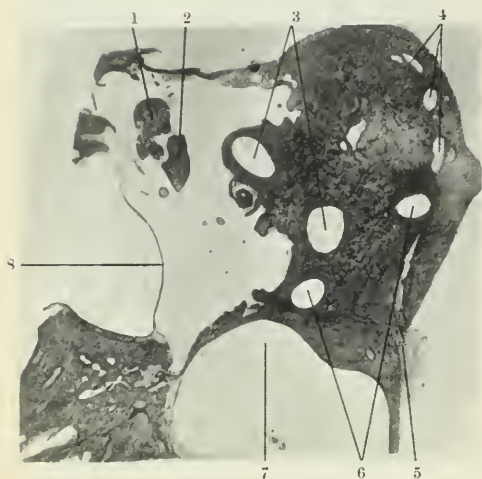


FIG. 7.—Normal right ear. No. 355.

1. Head of malleus.
2. Body of incus.
3. Two ends of external canal.
4. Air-cells behind labyrinth.
5. Sacculus endolymphaticus.
6. Two ends of posterior canal.
7. Jugular bulb.
8. Tympanic membrane.

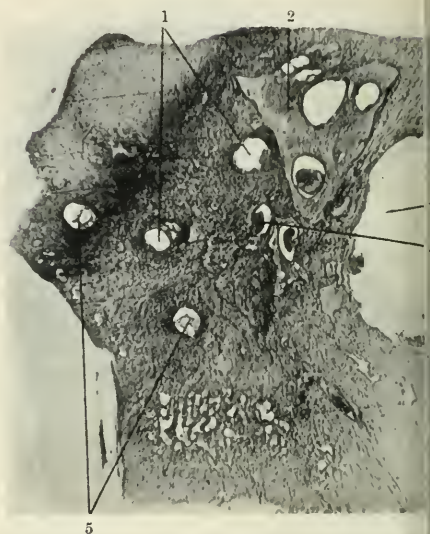


FIG. 7A.—Diseased left ear. No. 520.

1. External canal.
2. Aditus almost obliterated by thickening of mucous connective tissue.
3. External meatus.
4. Facial nerve.
5. Posterior canal; note new connective tissue in lymph space.

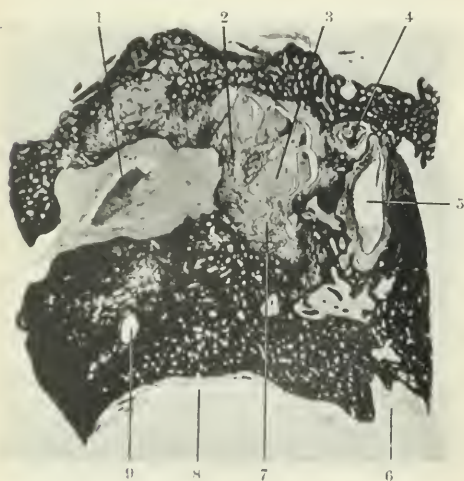


FIG. 7Y.—Diseased left ear. No. 153.

(Section stained by iron-haematoxylin method.)

1. Facial nerve well stained. Below and to the right the cochlear nerve is not stained, and shows degeneration.
2. Modiolus.
3. Dilated cochlear duct of middle coil.
4. Tensor tympani.
5. Tympanic cavity.
6. Carotid canal.
7. Basal coil of cochlea replaced by new bone.
8. Jugular bulb.
9. Aqueduct of cochlea.



FIG. 7Z.—Diseased left ear. No. 350.

(Section stained by iron-haematoxylin method.)

1. Extradural abscess.
2. Vestibule filled with new connective tissue.
3. Facial nerve.
4. Tensor tympani.
5. Handle of malleus.
6. External meatus.
7. Promontory.
8. Jugular bulb.
9. Band of new connective tissue joining extradural abscess to jugular bulb.

backwards, at right angles to the long axis of the petrous pyramid, and are viewed as they would appear to an observer standing in front of the patients—thus the normal right ear is on the reader's left, while the diseased left ear is on the reader's right.]

Naked-eye Appearances of Diseased Ear.—The dura mater in the floor of the middle fossa is greatly thickened where it covers the left tympanic cavity and labyrinth (pachymeningitis). On the posterior surface of the petrous bone the dura is also thickened above and behind the internal auditory meatus. The extra-dural abscess above and behind the labyrinth has been opened in removing the brain, but still contains pus (Figs. 5A and Z), which, due to the formalin fixation, presents a putty-like character. The sacculus endolymphaticus appears normal and, when opened, is found to contain no pus. The left tympanic membrane is much retracted and the outline of the malleus can only be made out with difficulty. The tympanic membrane does not give when touched with the probe. There is slight thickening in the roof of the jugular bulb, but there is apparently no general thrombosis of the bulb itself.

Microscopic Examination of the Middle Ear: Tubal Part of the Tympanic Cavity (Fig. 1A).—The superficial epithelium presents an almost normal appearance. The submucous tissue is greatly thickened and shows areas of round-cell infiltration. The lumen of the tubal part of the tympanic cavity contains homogeneous or finely granular exudate which stains deep pink with eosin. The air-cells in the floor of the tubal portion of the tympanic cavity are greatly narrowed by fibrous thickening of the submucosa.

Meso-tympanic Cavity.—The tympanic membrane is greatly thickened (Fig. 6A) and is in places adherent to the inner wall of the tympanic cavity, which is reduced in size by fibrous thickening of the submucosa. In this thickened submucosa there are areas of dense small-cell infiltration (abscesses?). This is especially seen in the region of the promontory, where there are still the remains of a fistula into the basal coil of the cochlea (Figs. 3A and 4A). What is left of the tympanic cavity contains a homogeneous or finely granular exudate (Fig. 6A), similar to that seen in the Eustachian tube. There is a considerable amount of new bone formation in the walls of the tympanum. In the thickened submucous tissue there are numerous cystic spaces filled with exudate (Figs. 4A and 7A). The remains of a small perforation of the tympanic membrane can still be made out posterior to and below the handle of the malleus (Fig. 5A).

Epi-tympanic Cavity.—The attic is narrowed by fibrous thickening of the submucous tissue (Fig. 6A).

Hypo-tympanic Cavity.—The cellar is entirely obliterated by the marked fibrous thickening of the submucous tissue (Figs. 4A and 6A).

Tympanic Ossicles and Muscles.—The *malleus* is present, but the head shows erosion of the joint surface (Fig. 6A), and is adherent to the inner wall of the attic by means of vascular fibrous tissue which has probably replaced the body of the incus. The body of the incus, along with the short and long processes, have entirely disappeared, but the joint between the incus and stapes remains. The stapes is present, and though embedded in thickened mucosa, appears normal (Fig. 5A). The stapedius muscle appears normal, but the tensor tympani is slightly atrophic.

Oral Window.—There is no perforation of the fenestra ovalis, but the mucous membrane and submucous tissue of this region are markedly thickened (Fig. 5A).

Round Window.—The niche of the round window is entirely filled up by fibrous thickening of the submucous tissue (Fig. 5A). The secondary tympanic membrane is incorporated in the fibrous tissue which fills the scala tympani and the round window niche.

Aditus and Antrum.—These spaces, like the tympanic cavity itself, are almost entirely obliterated by fibrous thickening of the submucous tissue (Fig. 7A).

Labyrinth Capsule.—The inter-globular space bone, which is formed from the original cartilaginous capsule of the labyrinth, is very irregular. This is well seen around the basal coil of the cochlea, where the normal line of demarcation between the cartilage bone and the lamellar bone is very indistinct and irregular (perilabyrinthitis, Fig. 1A). In the posterior wall of the vestibule the cartilage bone has been eaten through, so that the contents of the vestibule are in contact with the extradural abscess described below (Figs. 5A and 6A). The smooth end of the external semicircular canal also shows some irregularity of its wall. The lamellar bone which surrounds the cartilage bone is very vascular, and is markedly thickened on the inner wall of the tympanic cavity.

An extradural abscess is present in the floor of the middle fossa and also in the posterior fossa behind and above the internal auditory meatus (Figs. 3A, 4A, 5A, and 6A). In the middle fossa the abscess extends forwards above the cochlea and outwards to reach the geniculate ganglion (Fig. 4A). Posteriorly the abscess extends above the superior semicircular canal. The bony covering

of the cochlea, vestibule and superior canal is markedly eroded by this extradural abscess.

Posteriorly to the internal meatus there is a track of fibrous tissue leading from the extradural abscess of the middle and posterior fossæ downwards to the roof of the jugular bulb (Fig. z).

Pus-formation can be seen in the labyrinth nucleus in the region of the fossa subarcuata beneath the dome of the superior canal.

The Labyrinth : Cochlea, Basal Coil.—The endosteum of the cochlea is greatly thickened, and the outline of the endosteal bone which lines the cochlea is rough and irregular on account of new bone formation (Fig. 1A). The basal coil of the cochlea is filled with fibrous tissue in which much new bone has been deposited. The lower part of the basal coil is entirely replaced by new bone (Figs. 2A and z). The scala tympani shows more formation of new bone than the scala vestibuli. Below and in front of the round window there can still be seen the remains of an old fistula from the tympanic cavity which has opened into the scala vestibuli and scala tympani of the basal coil (Figs. 3A and 4A). A slender process of fibrous tissue can be seen extending from this region downwards and inwards through the bone towards the jugular bulb (abscess track along venous route?). There is also a track of fibrous tissue from the inner wall of the tympanic cavity and basal coil inwards to the fundus of the internal meatus.

Middle Coil.—This has evidently been less severely affected than the basal coil, for although it shows some new-formed fibrous tissue and bone, the scalæ are mainly filled with homogeneous material. The cochlear duct is markedly dilated in this coil (Fig. y); Corti's organ and the membrana tectoria have entirely disappeared. The fibrous tissue in the scala tympani contains many new-formed blood-vessels, and the outline of all the scalæ are irregular at parts on account of the contraction of new fibrous tissue and the formation of new bone.

Apical Coil.—This region is even less affected than the middle coil and there is no new bone formation. The three scalæ are, however, filled with homogeneous exudate.

The Aqueduct of the Cochlea.—At the site of the opening from the scala tympani the perilymphatic aqueduct is entirely obliterated by new bone formation, although the outline of the opening can still be seen (Fig. 4A). Lower down there is considerable thickening of the lining membrane of the duct, the lumen of which contains some pus-cells. At the cranial end the fibrous thickening is very marked (Fig. 1A).

Modiolus.—The central canal, spiral canal and hollow spaces of the bony spiral lamina are all filled with new-formed fibrous tissue which replace the nerves and ganglia (compare Fig. 2A with Fig. 2). A considerable quantity of brownish pigment is present in the hollow spaces of the modiolus and bony spiral lamina.

The Vestibule.—This cavity is almost entirely filled with new fibrous tissue, in which there is very little new bone-formation (Figs. 5A and 6A). Just above the secondary tympanic membrane there is, however, a mass of new-formed bone (Fig. 5A). The utricle and saccule have disappeared and are replaced by fibrous tissue. Here and there in this tissue small collections of round cells (remains of abscesses) may be seen. On the inner wall of the vestibule towards the roof the bone has disappeared so that the fibrous tissue filling the vestibule is in contact with the extradural abscess in the floor of the middle fossa. This breaking through appears to have occurred in the region of the common opening of the superior and posterior canals (crus commune) (Fig. 5A). The smooth end of the external canal also shows some erosion of bone. The aqueduct of the vestibule cannot be recognised at the vestibular end. The lower part of the ductus endolymphaticus along with the sacculus appear to be normal.

Semicircular Canals.—The canals are less affected than the other parts of the labyrinth (Fig. 7A), and in places the membranous canals can still be seen. The perilymphatic space of all canals contains pus and exudate in which a little new-formed fibrous tissue may be seen. There is some erosion of the bony lining of the external semicircular canal at its non-ampullary end.

Internal Auditory Meatus with Seventh and Eighth Nerves.—The dura mater lining the internal meatus is greatly thickened and shows marked small-cell infiltration as well as numerous dilated blood-vessels (Figs. 1A and 2A). The bony floor of the meatus is markedly eroded and presents a small abscess near its cranial end. Towards the inner end the superior wall of the bony meatus is perforated so that the extradural abscess in the middle fossa is in direct contact with the dura lining the upper wall of the internal auditory canal. Numerous pus-cells are present between the thickened dura and the remains of the eighth nerve. The two divisions of the eighth nerve can hardly be recognised, as they are incorporated with the granulation and fibrous tissue which fills the meatus. The vestibular nerve to the utricle is replaced by fibrous tissue. Traces of the vestibular ganglion can still be seen, and some fibres of the cochlear nerve can be traced from the internal

meatus to the modiolus. The facial nerve, on the other hand, appears more normal, and in sections stained by the iron-haematoxylin method (Fig. x), the nerve can be traced through the meatus up to the geniculate ganglion. This latter structure is in contact with the pus of the extradural abscess in the floor of the middle fossa. The lining of the facial canal is greatly thickened in the region where the nerve passed above the cochlea.

Remarks.—The writer is indebted to Dr. G. M. Johnston, of Seafield Hospital, Leith, for the following particulars of the case. The patient had suffered from a foul-smelling discharge from his left ear since boyhood. For some weeks before admission he had been in bad health, and a day or two before his arrival at the hospital he had suffered from severe pain in the ear and from marked giddiness, which had caused him to fall on one or two occasions. On admission (May 7, 1912), he complained of pain in the left ear and headache, and tended to fall to one side (left?). He also suffered from hallucinations of hearing. At the time of the patient's admission to the Royal Edinburgh Asylum (May 29, 1912) the effects of the labyrinthine attack were evidently passing off. Death occurred on July 15, 1912.

The case, therefore, was evidently one of chronic purulent otitis media on the left side of long duration, complicated in the beginning of May, 1912, by an attack of acute purulent labyrinthitis. It is unfortunate that no functional examination of the ear was carried out, though it would probably have been impossible to test the patient's hearing, at any rate during the first part of his residence at the Royal Edinburgh Asylum. Functional examination of the vestibular apparatus by cold syringing, however, could have been carried out.

[The difficulty of making an accurate functional examination of the ear of insane patients will be obvious to all. Some years ago the present writer (J. S. F.) attempted to inquire into the condition of the ears of insane patients suffering from hallucinations of hearing, and examined twenty-two cases at the Royal Edinburgh Asylum. Of these, five presented gross abnormality of one or both tympanic membranes—perforations, scars, or marked retraction and opacity. In the great majority of cases, however, tinnitus aurium is due to a lesion of the cochlear ganglion and nerve, or to otosclerosis. In order to detect these conditions it is, of course, necessary to make an accurate functional examination by means of tuning-forks, watch, voice, Galton whistle, or monochord. Such an examination was quite out of the question in almost all of the

twenty-two cases examined, and the attempt to establish a pathological basis for the tinnitus was therefore abandoned.]

The character of the microscopic changes in the present case would appear to indicate that the inner ear had been affected for a period of about three months. The infection seems to have spread from the tympanic cavity to the labyrinth by erosion of the lower part of the basal coil of the cochlea. The usual sites of fistula formation, namely, the oval window and the external canal, show no sign of perforation. The niche of the round window and the scala tympani above it are obliterated by fibrous tissue. The microscopic changes are most marked in the lower part of the basal coil of the cochlea and in the adjacent portions of the vestibule, as well as in the remainder of the basal cochlear whorl. In the canals the changes are less marked and less advanced than in the vestibule and cochlea. From the vestibule the pus seems to have spread to the subdural space by eroding the crus commune of the superior and posterior canals, and thence to have extended forwards and outwards over the cochlea and vestibule. The roof of the internal meatus appears to have been eroded by the extradural pus burrowing downwards.

The inflammatory process also appears to have passed inwards from the basal coil of the cochlea to the internal meatus in its lower part.

As will be seen from the photo-micrographs, the extradural abscess appears to be of much more recent date than the labyrinthitis. If this be accepted it goes to support the view suggested by Drs. Henderson and Muirhead, that the acute general infection, from which the patient died, was due to an acute extension of the septic process in the left ear.

In three similar cases of latent labyrinth suppuration recently examined by the present writer a cerebellar abscess was present, but in the case under consideration the brain appeared remarkably healthy on naked eye examination.

In conclusion, the writer wishes to acknowledge his indebtedness to the Carnegie Trust for providing the illustrations.

NOTE ON THE MICROSCOPICAL EXAMINATION OF THE MIDDLE AND INNER EAR BY THE CELLOIDIN METHOD.

(The writer claims no originality for the details of this method, which has been only slightly modified from those employed by Dr. Erich Ruttin, of Vienna, and Dr. F. R. Nager, of Zurich.)

Preparation of the Block of Bone containing the Middle and Inner Ear.—The temporal bone must be obtained as soon as

possible after death—certainly within twenty-four hours. In removing the brain the seventh and eighth nerves should be cut close to the pons, so as to leave as much as possible attached to the temporal bone. The dura mater is cut with a knife round the internal auditory meatus in order that the nerves may not be pulled out when the dura is stripped off. The sacculus endolymphaticus is examined with the naked eye and for this purpose a crucial incision is made into it. The dura mater is now removed with bone forceps from the upper and posterior surfaces of the petrous bone. With the saw a cuboidal block containing the important parts of the middle and inner ear is cut out from the temporal bone. The first saw-cut is made in a vertical direction at right angles to the long axis of the petrous pyramid just in front of the internal auditory meatus. The second cut is made parallel to and behind the first, through the mastoid antrum—posterior to the semicircular canals. The third vertical saw-cut is made in an antero-posterior direction through the middle cranial fossa and external auditory meatus, and runs parallel to the posterior surface of the petrous pyramid and to the middle-ear cleft. The last cut runs through the jugular fossa and is made in a horizontal direction below the middle and inner ear.

In this way a six-sided block is obtained, but it requires some trimming. The anterior wall of the external meatus should be cut away with bone forceps, so that the tympanic membrane may be exposed and its condition noted. The jugular bulb is also inspected and thereafter its lining membrane is removed with dissecting forceps. The carotid canal is opened up with bone forceps and the artery removed—care being taken not to injure the Eustachian tube, which lies just external to this vessel. Finally, the superior semicircular canal is opened with bone forceps in order to allow the fixing fluid to gain access to the inner ear. (It must be noted that the superior canal lies somewhat in front of the arcuate eminence.) The block so obtained is washed in running water to remove bone-dust and is then placed in 5 per cent. formol for one month—the fluid being changed on several occasions. If the nerve-structures are to be specially examined, it is best to place the block in Müller's fluid after it has been twenty-four hours in formol. The Müller's fluid must be changed frequently.

Decalcification, Washing and Hardening.—After the block has been fixed it may be decalcified in 5 per cent. formol and 5 per cent. acid (equal parts) for one month or six weeks, according to the size of the block. During the first week the fluid is changed

daily, during the second week every second day, and during the third and following weeks the fluid should be changed twice weekly. In place of the above mixture, Perenny solution may be used; this consists of nitric acid (10 per cent.), 400 c.c.; absolute alcohol, 300 c.c.; chromic acid (0.5 per cent.), 300 c.c. After decalcification the block is washed in running water for four or five days. The specimen is now hardened for the second time, first in 70 per cent. spirit for twenty-four hours, then 80 per cent. for twenty-four hours, then methylated spirit for three days (this latter solution being changed daily). From methylated spirit the block is passed into absolute alcohol for two days (changed daily), and then into absolute alcohol and ether (equal parts) for two days (changed daily).

Embedding.—The block is now put in thin celloidin (Schering's) for one month and then transferred to thick celloidin for one month. (During the time the block is in the thin celloidin it may be an advantage to use the evacuation-pump so as to get rid of air-bubbles from the hollow spaces of the middle and inner ear, but the negative pressure employed must not be excessive, otherwise the structures of the membranous labyrinth may be distorted.) At the end of the second month of embedding, the lid of the glass jar containing the block is left partially open so that the specimen may gradually dry and harden. When the celloidin is thoroughly hardened—usually in about a week—the block is cut out with a knife and pared down with a razor to the required size, *i. e.* about three quarters of an inch square.

Cutting.—The block may be cut in one of two directions: (1) Horizontally, from above downwards; in this way some four hundred sections are obtained, 20 micromillimetres in thickness. (2) The specimen may be cut vertically, from before backwards; in this way about seven hundred sections are obtained. After deciding in which direction the block is to be cut, it must be fixed on a piece of stabilite; the block is dipped into absolute alcohol and ether for a moment and then into thick celloidin and placed on the stabilite with the surface to be cut uppermost. The specimen should now be left for half-an hour or more so that the celloidin may harden. The stabilite block with the specimen attached is then fixed in the Schantze microtome (if not cut at once it must be kept in a jar containing spirit). If the block is very hard, sections may sometimes be obtained 10 mm. in thickness, but as a rule 20 mm. give sufficiently thin sections. The writer has been in the habit of numbering and staining every fifth section only; the intervening

ones are placed in a large jar containing spirit. In very important cases, however, such as deaf-mutism or otosclerosis, every section should be numbered and stained. In less important cases the sections which are selected for staining are placed on a slide and wrapped up in a strip of blotting-paper moistened with spirit; they must on no account be allowed to dry. Each slide is numbered with a diamond, thus—"William Smith, 5, 10, 15, etc." As each hundred sections are cut, the selected twenty are tied up together in a bundle, labelled and kept moist with spirit. When all the sections have been cut, they are placed in a large glass jar containing spirit.

Staining.—The blotting-paper is unwrapped and the section removed by tapping the slide against the side of a bowl containing water. The section is now lifted with a copper section-lifter and placed in a watch-glass containing filtered hæmalum (Mayer's). In this the section remains for a period varying from five to thirty minutes, according to the quality of the staining solution. The section is then lifted out and thoroughly washed in a bowl of water, and then transferred to a watery solution of eosin ($\frac{1}{4}$ to $\frac{1}{2}$ per cent.). The time taken for staining with eosin varies from two to ten seconds as a rule. The specimen is again washed in a second bowl of water and transferred to a third watch-glass containing spirit, in order to remove the excess of eosin. From this it is passed on to a fourth and fifth watch-glass containing spirit, and is then placed for a second or two in a sixth watch-glass containing absolute alcohol. Finally, the specimen is removed to a seventh glass which hold scarbol-xylo, where it remains for a minute or two until it sinks to the bottom of the glass. The section is then transferred with the aid of a needle and a copper section-lifter to the numbered slide from which it was taken for staining purposes. It is now covered with Canada balsam, and with the aid of a needle a clean cover-slip is slowly let down over it so as to exclude air-bubbles.

Other staining methods may be employed, *e.g.* van Gieson, iron alum, osmic acid, etc. For details of these methods the reader is referred to text-books on histology.

It is possible to work three rows of watch-glasses (twenty-one in all) containing the various solutions at one time, and in this way from sixteen to twenty sections can be stained in two hours.

It will be seen that the process required for the microscopical examination of the middle and inner ears is a somewhat lengthy one, taking, as it does, about six months. It must also be confessed

that many difficulties and disappointments are met with, notably injury to the ear in cutting out the block of bone, failure to decalcify sufficiently, presence of air-bells in the hollow spaces of the middle and inner ear, and faulty staining. For all these reasons the microscopical examination of the ear is not a task to be lightly undertaken.

J. S. F.

THE TREATMENT OF NASAL ACCESSORY SINUS SUPPURATION BY IONISATION.

PRELIMINARY COMMUNICATION.

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It is generally admitted that the operative treatment of accessory sinus disease, by whatever method, is not universally satisfactory, and as great relief, and in a number of cases absolute cure, can be obtained in the most unpromising cases by ionisation, the technique described might be useful for those wishing to try; not that it is perfect by any means, but it may probably stimulate those with an inventive genius to simplify the apparatus and improve the instruments.

The same method is applicable to both frontal and maxillary sinus disease, and the apparatus consists of—(1) The Symonds frontal cannula, 6 in. long, insulated by dipping in collodion or celloidin. (2) Three pieces of indiarubber tubing, all with the same calibre: (a) one piece 2 in. long, (b) second piece 1 ft. long, (c) third piece 2½ ft. long. (3) Two pieces of glass tubing and glass funnel capable of holding half an imperial pint. (a) One piece of glass tubing to be T-shaped, the lateral limb ½ in. long and fitted with an indiarubber cork with a perforation through the centre; (b) the other piece of glass tubing to take the form of a Y, to the limb of which indiarubber tubing with a screw clamp of about 4 in. long attached. (4) Two electrodes, the active one made of platinum wire and 6 in. long for maxillary sinus and 8 in. for the frontal. (5) The large indifferent electrode made of aluminium, 5 by 8 in., with a binding screw. (6) Two well-made electrical cables covered with indiarubber or silk, and about 6 ft. long. (7) A 1 per cent. solution of zinc sulphate ready made, or B. & W.'s tabloids to use as required. (8) Eight to ten layers of lint. (9) A universal electrical apparatus with milliampère-meter, or an "ionic medication outfit," such as figured on page 13 of the Cavendish Electrical Co.'s latest catalogue.

To put the apparatus together ready for use: Take the 2-in. rubber tubing and fit it on to the T glass tubing, to the other end of the glass fit the foot rubber tubing followed by the Y glass tubing, then the 2½ ft. rubber tubing which carries the glass funnel. To the spare limb of the Y glass fit the four inches of rubber tubing carrying the small screw-clamp, while to the small limb of the T

glass pass the electrode through the perforation in the cork on through the 2-in. rubber tubing, so that the platinum projects 6 in. from the distal end of this small piece of tubing.

Frontal Sinus.—The diagnosis having been made, under local anæsthesia, the anterior end of the middle turbinate is removed, and sufficient of the anterior ethmoidal region opened into and curetted to allow of the easy entrance of the cannula, the fronto-nasal duct being further dilated if necessary with Dundas Grant's bougie, the ordinary syringe attached and the pus blown out and collected for bacteriological and cytological examination. The patient is now given a rest for ten days. On the tenth to the twelfth day the sinus is ionised, the insulated cannula passed, and pus again blown out; it is well washed out with equal parts of distilled and boiled water, then irrigated with the 1 per cent. zinc solution, this part being done in the ordinary diagnostic chair in the sitting position, the cannula being held. The patient is now made to lie down on the couch, and the indifferent (negative) electrode is bound on to the arm or placed between the shoulders. The patient's head is bent over the end of the couch and the platinum (positive) electrode is passed through the cannula, having previously observed that its end does not project more than 1 mm. beyond that of the cannula. The two-inch india-rubber tubing is tied on the cannula, making the whole apparatus continuous and ready for the next step. The glass funnel is now at the level of the patient's head, slowly filled with the zinc solution and gradually elevated until it is found to be flowing away. This is soon perceived by the patient as it drops into the post-nasal space and has to be hawked up (the one disagreeable part of the treatment), so that a receiver has to be ready at the patient's mouth to receive it. If the zinc solution is not running the point of the cannula is in contact with the sinus lining, and slight manipulation of the cannula will rectify matters, but if it does not do so after some coaxing the screw clamp on the V limb is undone, the rubber tubing pinched below the funnel, and from a glass syringe some solution is forced down the V glass until the flow is seen to start, the clamp tightened, and the irrigation proceeded with. The syringe may require to be used during the process, as occasionally the point of the cannula gets blocked. The current is now turned on and the strength regulated by the feelings of the patient—which is anything up to 12 mm.—while ten minutes is about the time the patient cares to undergo the process. The current being turned off the tubing is dis-

connected, and the patient having resumed the sitting position the excess of zinc solution is removed by blowing with the ordinary india-rubber syringe. During the ionisation the head is slowly turned from side to side and from before backwards.

Maxillary Sinus.—Explore with the insulated Lichtwitz trocar and cannula, blow pus out, irrigate first with equal parts of boiled and distilled water, then zinc solution. Now pass the platinum electrode along the cannula and fix on the rubber tubing so that the apparatus is connected; the patient sits in the usual chair and the zinc solution is poured into the funnel until it is felt in the throat or seen to come out of the nose, when the funnel is lowered until irrigation is seen to go on very slowly; the current is now turned on, and during the process the head is changed into various positions so that all the lining membrane will be brought in contact with the ions. Here the patient can bear the process quite fifteen minutes. When finished, the apparatus is disconnected from the cannula and the excess of solution blown out.

Nasal Mucous Membrane.—In the ordinary sitting position the nasal mucous membrane is carefully cleansed with weak peroxide, distilled and boiled water, and finally with zinc solution. The patient is placed on the couch with the head on a pillow and gently extended over the end of the pillow; the post-nasal space is now plugged with a Eustachian catheter made straight, and to the distal end of which two inches of finger-stall is tightly attached; to the outer end of the catheter a small tap is fixed with two inches of rubber tubing. The catheter, with rubber bag, is passed along the nostril into the post-nasal space and filled with plain water to such a degree that it will completely block the choana and make it watertight. The side is now filled with the zinc solution through a large-sized vulcanite speculum and the platinum or zinc electrode immersed through the speculum into the centre of the solution, the current is turned on, a few drops of zinc solution being frequently added to make up for what is lost by running out of the nose. Before the patient leaves I swab the nasal mucous membrane with a 20 per cent. aqueous ichthyol and put cotton-wool into the nostril.

The same method applies to the middle ears, but here there is no previous plugging.

The process in the nose and ear, however, can be simplified by having the platinum electrode made to enter through the thickness of the speculum and carried some way down, thus doing away with the necessity for holding the electrode.

Although this paper is dealing chiefly with the accessory sinuses, it might not be out of place to state that any form of rhinitis can be improved by ionisation, but more especially ozæna and the atrophic variety, while hypertrophy of the mucous membrane of the inferior turbinates is best dealt with by plunging a pointed zinc electrode for at least $1\frac{1}{2}$ in. between the mucous lining and periosteum, but as the zinc has not sufficient stability I always pass a tenotomy knife, then through the wound thus made insert the sharp-pointed zinc electrode, which, however, must be insulated up to the point where it leaves the mucous membrane, otherwise a small ulcer will form which takes some time to heal. Again, ionisation is extremely useful in all forms of chronic suppurative middle-ear disease provided dead bone can be excluded, but it is particularly useful after the radical or conservative mastoid operations where the discharge persists longer than four weeks due to some hidden, unhealthy granulation-tissue. Here two applications invariably permanently cure the condition. I have had no success with transtympanic ionisation for chronic catarrh or otosclerosis.

Finally, before starting the apparatus must be carefully tested to see that it is working properly. This can be done without damage to the milliamperemeter by bringing the electrodes together and turning on the smallest possible amount of current to give a spark; also it is advisable to have as few screw connections between the battery and the point of application in the sinus, as any break in the current at this work is felt severely by the patient. For that reason all my electrodes are soldered on to the cable. And finally, if ionisation is going to be of use in any case improvement will begin after two applications, while if the condition is not improved after six there is hardly much use in continuing the treatment.

I have also had considerable success in catarrhal and obstructive lesions of the Eustachian tubes with ionisation. The method adopted is to have the usual zinc rod insulated after the method of Carè by having cotton thread twisted carefully on to the last two inches, which is then kept in gelatine and formalin alternately until a coating has formed similar in thickness to No. 3 silver Eustachian catheter. The zinc rod being then bent to have the same radii as the catheter, before use the insulated electrode is put in zinc solution for five minutes and then passed through the nose, and by the aid of the post-rhinoscopic mirror or pharyngoscope is inserted as far as possible into the Eustachian tube; to prevent the remaining part of the electrode touching the nasal mucous membrane a fine rubber tube

is threaded on; then the usual handle connected with the multostate. The current is turned on for ten minutes, then reversed for four. This treatment is done once weekly.

What is required, however, in this work is for the cannulas to be made of a non-conducting metal, for although I have succeeded in insulating the outside of the cannulas with collodion, and, more recently, with silk and rubber dissolved in chloroform and acetone, the inside of the instrument is acted upon and soon narrows in calibre.

CLINICAL NOTE.

THE MECHANISM OF ONE FORM OF RESPIRATORY STOPPAGE UNDER GENERAL ANÆSTHESIA (ETHYL CHLORIDE).

By J. D. LITHGOW, F.R.C.S.E.

EVERYONE is familiar with the effect which follows the passage backwards of the lower jaw and tongue during general anæsthesia, thus causing either embarrassment or complete stoppage of the respiration. It is equally well known that in most cases of this condition, it is only necessary to draw the jaw forward to allow respiration to go on freely; while at other times one has to exert, in addition, traction on the tongue itself (*Lister*).

I have recently observed in several cases during general anæsthesia under ethyl chloride for the enucleation of tonsils with the guillotine, that after the patient is fairly well under, the breathing suddenly stops, the countenance becomes livid, and violent inspiratory efforts are made, but no air enters the chest. In these cases, neither drawing forward the jaw nor traction on the tongue have the slightest effect in relieving the embarrassment. On introducing the finger, one finds the epiglottis firmly attached, like a boy's leather sucker, to the posterior pharyngeal wall, from which one is unable to dislodge it, even by forcible traction on the tongue, but on passing the nail and point of the index finger under its edge, it suddenly relaxes its sucker-like grip on the pharyngeal wall, and the chest instantly fills with air. In the last case of this description this valvular action, associated with stoppage of the respiration, was repeated on removing my finger, and eventually I had to hold the epiglottis forward until the patient was quite out of the anæsthetic. I have not as yet been able to determine whether the few cases in which I have observed this mechanism had any special anatomical formation of the upper orifice of the larynx predisposing to this sucker-like action. Should this form of respiratory stoppage occur after the tonsils have been removed, one might be inclined to suspect that a tonsil or accidentally detached tooth had become impacted in the glottis, and thereby be tempted to have recourse to an unnecessary tracheotomy.

The remedy, therefore, in such a case is to force the point of the index finger between the epiglottis and the posterior pharyngeal wall, and maintain them apart until free respiration is established.

SOCIETIES' PROCEEDINGS.

PROCEEDINGS OF THE ROYAL SOCIETY OF
MEDICINE—LARYNGOLOGICAL SECTION.

May 2, 1913.

MR. HERBERT TILLEY, *President, in the Chair.*Discussion on the *Ætiology* of Unilateral Paralysis of the
Recurrent Laryngeal Nerve.

CASES.

Nearly Complete Paralysis of Left Vocal Cord of Unexplained *Ætiology*.—William Hill, M.D.—Male, aged twenty-four, came complaining of loss of voice which followed the operation of internal urethrotomy three weeks before. The left cord was immobile and shorter than the right; the left arytaenoid was in a considerably more forward position than the right, and prevented sufficient approximation of the right cord to the paralysed left cord on attempted phonation. The laryngoscopic picture suggested *long-standing* paralysis with post-paralytic contracture. He contracted gonorrhœa four years ago, but there is no history of this having been followed by arthritis. Examination of the neck and chest by the usual methods (including the X rays) throws no light on the cause of the paralysis.

[*Note* (made one month subsequent to the meeting).—The voice has much improved. There is fair movement of the cord, but the left arytaenoid still occupies a more advanced position than the right, and does not move so freely.]

Recurrent Paralysis due to Aneurysm of the Arch and Descending Aorta of which Physical Examination of the Chest gave no Indication.—William Hill, M.D.—An old man from whom this skiagram was taken was shown on December 1, 1911.¹ He came to hospital complaining of hoarseness. The left vocal cord was paralysed, but a careful examination of the chest revealed no positive evidence of aneurysm. There was, however, unequivocal tracheal tugging, and a skiagram showed a large aneurysm.

Left Recurrent Laryngeal Paralysis, probably due to Dilatation of the Left Auricle.—E. D. Davis, F.R.C.S.—Woman, aged forty, had well-marked mitral stenosis with hæmoptysis and failure of compensation. In 1908 she had been treated for loss of voice, by rest in bed and faradisation of the larynx, and after treatment for two months the voice returned. In 1911 she again complained of loss of voice, and stated that she had had hæmoptysis and that the sputum had been examined for tubercle bacilli with a negative result. Examination showed paralysis of the left recurrent laryngeal nerve with slight adductor movement and a little laryngitis. The skiagrams of the chest are shown. The X-ray screen revealed dilatation and displacement of the heart to the left and an opaque posterior mediastinum.

Left Recurrent Laryngeal Paralysis following Acute Endocarditis and Pericarditis.—E. D. Davis, F.R.C.S.—Male, aged nine-

teen, was extremely ill in 1912 with heart failure, mitral regurgitation, and pericarditis. The voice was weak and hoarse. The larynx was examined when the patient was convalescent, in February of this year, and complete left recurrent laryngeal paralysis, with slight compensatory over-action of the right cord, was found. Skiagrams were shown.

Right Recurrent Laryngeal Paralysis.—E. D. Davis, F.R.C.S.—Male, aged thirty-four, complained of deafness of the right ear following influenza. Incidental examination of the larynx showed right recurrent laryngeal paralysis, with over-action of the left cord. The palate and pharynx were normal. The voice was toneless, and the patient stated that he had lost his voice years ago. Skiagrams were shown, but no definite cause of the paralysis could be discovered.

Left Recurrent Laryngeal Paralysis.—Cecil Graham, F.R.C.S.—Male, aged forty-four. Weakness of voice since June, 1912. Occasional attacks of coughing, followed by vomiting. No hoarseness, no dysphagia, no enlarged cervical glands. Syphilis twelve years ago. Wassermann reaction positive. Shortening of left vocal cord; tilting forward of left arytenoid. Left cartilage of Wrisberg well defined. Radial pulses synchronous, and fairly full. Sluggish left pupil. Skiagram showed great increase in the aortic shadow.

DISCUSSION.

Dr. de Havilland Hall, in opening the discussion, submitted tabulated lists of the causes of the paralysis together with an analysis of the cases which had been shown before the Laryngological Society from its foundation until it ceased to exist as an independent society, *i. e.* from 1893 to 1907—fifty-two cases in all. In thirty-five cases the left vocal cord was affected, in sixteen cases the right, and in one case the affected side is not mentioned.

A further series of sixty-four cases of unilateral recurrent paralysis which he had observed himself was detailed.

The most common cause of left recurrent paralysis is aneurysm of the arch of the aorta. This occurred in twenty-eight times out of eighty-two cases. He further pointed out that the seven cases in which no definite cause for the paralysis was discovered were all on the left side. Some of these seven were almost certainly aneurysmal, as long clinical experience had taught him that paralysis of the left vocal cord is often the only objective indication of aortic aneurysm. In a case of this kind he detected the cadaveric position of the left vocal cord nearly a year before there were any other definite physical signs of the aneurysm. In these days the question would have been easily settled by an X-ray examination.

In cases of aneurysm of the arch of the aorta the left recurrent nerve is almost exclusively affected. This is shown by the fact that out of thirty-one cases of paralysis of the recurrent nerves from the pressure of an intra-thoracic aneurysm, the left recurrent nerve was affected in twenty-eight cases, and the right in only three. Paralysis of the left recurrent nerve not only points clearly to the probability of the existence of an intra-thoracic aneurysm, but it also indicates the position of the aneurysm as being seated usually on the transverse or descending part of the arch of the aorta. In thirty-five cases of aortic aneurysm recurrent paralysis was observed in twenty-one cases—nineteen times on the left side and twice on the right.

The physical signs of valvular disease of the heart may exist in association with left recurrent paralysis, so as to simulate very closely intra-thoracic aneurysm. Before the advent of the X-ray method of examination these cases were probably frequently mistaken for aneurysm.

When the paralysis is due to the effect of pressure other than aneurysmal the left recurrent nerve is affected nearly four times more frequently than the right. If the cases of malignant disease of the œsophagus be excluded, it might be stated baldly that the right recurrent nerve is hardly ever paralysed as the result of pressure within the thorax. It also appears that, after aneurysm, the most common cause of this paralysis is some growth within the thorax. This very striking difference between the two recurrent nerves must be owing entirely to their anatomical distribution. It is easily seen why an aneurysm of the arch of the aorta should almost exclusively affect the left recurrent nerve, but it is difficult to understand why the right recurrent nerve should almost entirely escape the effect of other kinds of pressure.

In cases of malignant disease of the œsophagus my figures show that the two sides are almost equally affected, *i. e.* nine cases of right recurrent paralysis, and eight cases on the left side.

Paralysis of the right recurrent nerve associated with dysphagia is almost invariably due to malignant disease of œsophagus. The same cannot be stated of left recurrent paralysis with dysphagia, but we should be justified in saying that the latter combination is most commonly due to malignant disease of the œsophagus. In exceptional cases dysphagia may be caused by an aneurysm of the descending thoracic aorta pressing on the œsophagus, while at the same time the left recurrent nerve is implicated in an aneurysmal dilatation of the arch of the aorta.

When recurrent paralysis is due to central causes or toxins the nerves are affected nearly equally.

Age is an important factor in the diagnosis of the cause of the paralysis. In children one would naturally think of diphtheria, tuberculous glands, cervical spinal caries, and meningitis. In young adults pulmonary tuberculosis, pleuritic thickening at the apex of the lung, and mitral disease, with enlargement of the left auricle, would be the most likely causes. Under the age of twenty-five aneurysm is extremely rare. In middle-aged men—*i. e.* from twenty-five to fifty-five—aneurysm is by far the most common cause. After the age of sixty the probability of malignant disease of the lung or of the mediastinal glands should be borne in mind.

The sex of the patient should also be taken into account, as thoracic aneurysm is a comparatively rare disease in females. Recurrent paralysis in a woman would suggest the pressure of a new growth, malignant disease of the œsophagus, or dilated left auricle rather than an aneurysm.

Sir David Ferrier, F.R.S., asked on what depends the special feature of recurrent laryngeal paralysis? Many years ago he had endeavoured to show that in peripheral paralysis, from whatever cause—neuritis, etc.—the extensor muscles were the first to suffer. Sir Felix Semon called his attention to the fact that the abductors of the vocal cords were the first muscles to be paralysed in affections of the recurrent laryngeal nerve. This falls in line with the other facts on which he had based his conclusions. These might be summarised as follows:

In peripheral neuritis, however induced, as from alcohol, lead, arsenic, beri-beri, etc., the extensor muscles of the limbs are the first, and often alone, affected. In lead poisoning we have the familiar drop-wrist, while the supinator longus supplied by the same nerve escapes. So in alcohol

we have at first drop-foot from paralysis of the muscles supplied by the external popliteal nerve. A similar condition obtains in beri-beri. Take again the case of pressure on the peripheral nerves. While severe and long-continued pressure on the musculo-spinal nerve causes paralysis of all the muscles supplied by this nerve—supinators as well as extensors—yet instances occur in which only the extensors are affected. So also in puerperal paralysis from pressure of the foetal head on the crural plexus, the muscles especially paralysed are the anterior tibial group supplied by the external popliteal nerve. The same thing happens in neuritis of the sciatic nerve, or when it is injected with Schlösser's fluid for the treatment of sciatica. All these facts point to a greater vulnerability of the extensor nerves to destructive influences. Parallel with this, and of the same significance, is the fact discovered by Onimus, that the extensor nerves lose their excitability after death sooner than the flexors and adductors. The greater vulnerability of the abductor fibres of the recurrent laryngeal, as exhibited in the effects of neuritis, pressure, cold, etc., is only an example of a more general law applicable to extensors in general. So far the law.

As regards the recurrent laryngeal paralysis so common in tabes, the question is whether it is due to central or peripheral causes, or perhaps both. Opinion is still divided on this question, and after reviewing the principal literature bearing on it, he thought that there were many points still requiring careful investigation by modern methods, and with more accurate anatomical knowledge of the nerve-centres than has been displayed in many of the published clinical records. There is, however, no doubt that, in the vast majority of cases of tabetic recurrent paralysis, neuritic or degenerative changes have been found in the vagus trunk, recurrent laryngeal, or in the intra-muscular nerve-endings, particularly in the posterior crico-arytænoid muscles. Though degenerative changes have also in several instances been described in the medulla oblongata, particularly in the floor of the fourth ventricle, it is questionable whether in any case of pure tabetic laryngeal paralysis of the usual type, primary degeneration has ever been demonstrated limited to the nucleus ambiguus, the recognised motor nucleus of the laryngeal muscles. So far as he could discover there were only two cases of tabes on record in which primary central lesion appears to have been demonstrated. In both of these cases, however, there was complete recurrent paralysis; and in one of them (v. Reusz's) there was paralysis also of the pharynx, palate, and partially of the tongue. These cases, therefore, cannot be regarded as typical of the condition usually found in tabes. And in those cases in which degenerative changes have been described in the nucleus ambiguus among others they may have been secondary to peripheral lesion—the so-called "*réaction à distance*," or retrograde degeneration.

If one considers the relatively small size of the cell groups constituting the nucleus, and their community of vascular supply, it would appear very unlikely that any acute lesion, such as that of anterior poliomyelitis, could pick out the cell groups of some only of the laryngeal muscles or even all without implicating to a greater or less extent those also of the palate and pharynx. As a matter of fact, this occurred in the case recorded by v. Reusz; and in the symptom-complex due to embolism of the posterior cerebellar artery paralysis of the palate and larynx are always associated with each other.

It is, however, theoretically possible that a chronic and slowly progressive degeneration, like that of muscular atrophy or bulbar paralysis, may

pick out the cell groups of the abductors apart from the others. But there is nothing in the symptomatology of muscular atrophy to support this contention. The extensor muscles are never individually affected in this disease. And in bulbar paralysis, in which the lips, tongue, pharynx and larynx are progressively affected, the weakness of the adductors of the vocal cords is the first symptom to attract attention to the larynx. Whether this is preceded by paresis or paralysis of the posterior crico-aryténoid muscles he could not say. Schlesinger, however, holds that this occurs in bulbar syringomyelia, but Iwanof, who has directed special attention to this point, has never, in the twenty-eight cases he examined, seen one in which there was paralysis of the posterior crico-aryténoid without implication also of some of the other laryngeal muscles. The point is, however, one well worthy of further investigation.

Taking all the facts into consideration, and pending further precise examination of the recurrent laryngeal nerves and their motor nuclei, he adopted the view already expressed by many eminent laryngologists and neuropathologists that the recurrent laryngeal paralysis usually observable in tabes is of peripheral origin, and conforms to the law applicable to mixed motor nerves in general—viz. that the extensors and abductors are more vulnerable and lose their vitality sooner than the flexors and adductors.

Dr. W. Permewan thought, in discussing the ætiology of the condition, that it was necessary once more to repeat what is a commonplace to laryngologists, but which is by no means generally recognised—viz. that in the first stage of unilateral organic paralysis there is no affection of voice, as the abductors are alone affected, and no affection, or a very slight affection, of breathing, because the other cord is able to make up the deficiencies. Thus unilateral abductor paralysis is often missed, or only discovered by accident.

The records of cases are also by no means complete. There is a failure to record cases which are due to the commonest causes. It is of little interest to publish cases, for instance, of left-sided paralysis due to aortic aneurysm, while any unusual or obscure case is carefully put on record. The result is that there is in any statistical statement an undue relative predominance of rare cases. So, too, in studying and comparing various collections of cases made by different authors, it is difficult to avoid the error due to the frequent repetition of the same case in various connections. The results, therefore, of statistical inquiry cannot at present be taken as of absolute value. But, as on the other hand the individual experience of any one observer is insufficient to establish general results, the study of records is the only way of arriving at even an approximation of the truth.

The speaker went on to refer to sets of collected cases, published by Avellis and others, and to the classification of causes of paralysis adopted by Sir StClair Thomson in his book on "Diseases of the Throat."

The total figures showed, in the speaker's opinion, an undue predominance of toxic cases and of cases due to traumatism. Still, the very numbers show that these are frequent and important causes of unilateral paralysis, and it is probable that in toxic affections will be found the explanation of a considerable number of cases whose cause has not been definitely ascertained. The frequency of aortic aneurysm as a cause of left-sided paralysis is known to all. In left-sided cases when no other obvious cause is present, aortic aneurysm will be found to be the cause in a very large percentage of cases. What that percentage is exactly it is impossible to say. Many cases of aortic aneurysm are never subjected to

laryngoscopic examination. Many others are not detected at all till sudden death either suggests or reveals its existence. Some cannot even be detected by radiography, and in particular just those small aneurysms of the under-surface of the arch which particularly affect the recurrent laryngeal nerve. In the last edition of Schmidt's work on "Diseases of the Upper Air-Passages," the editor says: "Among the symptoms of aortic aneurysm paralysis of the left recurrent is practically always the earliest, and it remains often for a long time the only sign." Given a case of left recurrent paralysis, aortic aneurysm is the first thing to be thought of, and must not be excluded unless it has been sought for with every diagnostic aid at our command.

One cause of left recurrent paralysis, to which much attention has been given during the past sixteen years, is the association of it with mitral stenosis. While admitting fully the fact of left recurrent paralysis being associated with the heart changes which follow mitral stenosis, Garel points out that at least two thirds of the cases were unconfirmed by an autopsy, and that even in those that were examined post-mortem the account of the finding does not always carry conviction. The suggestion that the left auricle when enlarged may compress the nerve against the arch of the aorta does not seem very convincing. The more probable explanation is that, when the heart becomes much increased in weight by hypertrophy of the right ventricle, that is enough to drag on the aortic arch, and thus stretch and eventually paralyse the nerve. The speaker had shown to-day one heart much enlarged from mitral stenosis, and one enormously hypertrophied from a patent foramen ovale. Each of these cases suffered for some time before death from loss of voice, but no laryngoscopic examination was made. He had shown them to suggest that the increased weight of the heart in this affection may be the real factor in producing that paralysis of the nerve.

Unilateral paralysis in *tabes dorsalis* is by no means uncommon. Laryngeal paralysis is sometimes the earliest observed sign of this disease. In my table there are forty cases of paralysis from syringobulbia. It is not surprising that a disease which actually destroys by gross lesion the nuclei of the vagus accessorius should result in paralysis of the larynx. According to Ivanow, the posticus is the first affected, and then the whole domain of the recurrent nerve. But often, in place of being strictly unilateral, there is complete paralysis of one side with affection of either the posticus or the internus of the other side. He suggests that Semon's law requires revision. The neuritic group of cases is a large one; they no doubt explain a considerable number of cases for which no clear organic cause can be found, and they are also the class of case, and possibly the only class of case, in which recovery occurs.

The bilateral representation of the movement of the laryngeal muscles in the cerebral cortex makes it extremely improbable that cerebral disease should produce unilateral paralysis. Yet Casselbury refers to six of such cases. It is possible that destruction of both centres may occur at the same time; but until every case has been examined, and the existence of no disease of the medulla is demonstrated, it will be safer to assume the non-existence of cerebral unilateral laryngeal paralysis.

Sir FELIX SEMON limited his remarks to the points raised by Sir David Ferrier. Sir David had stated that laryngeal abductor paralysis, characteristic of partial lesion of the recurrent laryngeal, was only an instance of the more general law that the nerves of the extensor muscles of mixed motor nerves are more vulnerable to destructive influences than those of the flexors and adductors. With regard to this statement Sir

Felix observed: (1) That the suggestion was as old as the proclamation of the fact itself; (2) that even if this analogy held good, it would only be an amplification, not an explanation, of the curious fact, and would not elucidate in the least the cause of the vulnerability of the abductor-fibres. But he (Sir Felix) gravely doubted whether the laryngeal phenomenon could be claimed as a simple instance of Ferrier's more general law, although he fully admitted, of course, that it seemed to fall into line with it, inasmuch as the laryngeal abductors in one sense were as antagonistic to the adductors as were the extensors and flexors of a limb, seeing that they served opposite movements. But with this likeness the similarity ended, and for the rest the physiological conditions of the antagonistic muscles of the larynx were widely different from those of the antagonistic muscles of the limbs. He summarised the objections to the law as follows: (1) That, whilst the antagonistic muscles of the limbs served physiologically equivalent functions, those of the larynx served *two different* functions (phonation and respiration), which were differently represented in the cortex and in the medulla; (2) that after division of the adductor-fibres of both recurrences *no inhibition* of the abductors could be obtained on stimulating the cortex with strong induction-currents, such as was the case with genuine antagonistic muscles in other parts of the body; and (3), above all, that the laryngeal antagonists differed from other antagonistic muscles in the sense that *organic* progressive disease always attacked the *abductors* first or even alone, whilst in *functional* affections the *adductors* suffered similarly exclusively. He (the speaker) did not know of analogous conditions in any other part of the body. He was convinced that the mutual relations of the antagonistic muscles of the larynx were of a more complex nature than those of the antagonistic muscles in other territories, and he could not admit that the conditions as observed in the larynx were a mere local illustration of Ferrier's general law.

With regard to Sir David's second proposition, viz. that the balance of evidence was in favour of the peripheral origin of tabetic laryngeal paralysis, he could not agree to this statement either. In his opinion that question was still quite open. The partisans of the exclusively peripheral theory had either ignored older carefully observed cases or had attempted to explain them away by maintaining that the medullary degeneration must be of secondary nature—a statement which so far had been neither proven nor disproven. Altogether, the number of reliable *post-mortem* examinations, by which alone this question could be decided, was at present still much too small for that purpose. He could not understand why, as in the analogous case of the oculomotor paralyses of tabes, the original lesion might not be as well of a central as of a peripheral origin. Why, if it were always peripheral, should *bilateral* abductor paralysis be observed so frequently? But even if it could be shown that the laryngeal paralyses of tabes were always of peripheral origin, that would not in the least militate against the correctness of his law, the non-validity of which could be demonstrated in one way only, viz. by *post-mortem* examinations and microscopic investigations of the vagus-nucleus, which would have to show that whilst there were foci of degeneration in that nucleus, the abductor muscles alone—or at any rate in a higher degree—were atrophic and degenerated, whilst the adductors had either entirely escaped or were, at any rate, less diseased than the adductors. Thirty-two years had now elapsed since the promulgation of his law, and in the whole of that time one single exception only had been actually established in a case of recurrent paralysis of peripheral origin (Saundby's), not a single one in a case of central causation.

And this brought him to Sir David's remarks about the initial adductor paresis sometimes observed in cases of *apparently* bulbar paralysis. That fact, too, had been recently brought forward as a proof against the validity of his law, although the observations in question had been of a clinical character only, and in not one single case had it been shown by microscopic examination of the parts after death that, whilst the *highest* point in which foci of disease had been found was the nucleus ambiguus, the adductor muscles were exclusively or preponderatingly atrophic and degenerated. Cases of apparent bulbar paralysis, in which such initial adductor-pareses were observed, do not, in reality, belong to the class of *bulbar* paralysis but to that of *pseudo-bulbar* paralysis, *i. e.* to that category in which foci of disease existed—either alone or in conjunction with actual bulbar lesions—*above* the laryngeal nucleus, *viz.* in the paths leading from the cortex through the corona radiata and the internal capsule to the medulla. Such cases, however, did not at all fall into the territory of his law, which only concerned the laryngeal nerves *from the nucleus of the vagus downward!*

In conclusion he wished to say, with reference to Dr. Permewan's remark that there had been lately a cry for "revision of Semon's law," that he heartily agreed with that demand. If it should be found by further investigation that the law was bad, the sooner it disappeared from accepted doctrines the better; if the law was good it would remain valid, as it had done now for more than thirty years, in spite of all attacks. He would loyally accept the result, but such a decision could only be arrived at on the strength of thorough and complete *post-mortem* examinations and microscopic investigations carried out by experts, not on the basis of purely clinical observations, which, as the past had abundantly shown, were open to numerous fallacies and mistakes.

Dr. WATSON-WILLIAMS said the value of laryngeal paralysis or paresis in cases suspected of aneurysm was not now so momentous as formerly, because in most cases skiagraphy solved the problem. With regard to the points raised by Sir David Ferrier and Sir Felix Semon, it struck him at once that the question as to whether the tabetic lesions were peripheral or central in origin in no way controverted Semon's law, though it was a matter of great interest. There were cases in which there was an association of abductor paralysis of one vocal cord with the corresponding side of the palate, due perhaps to the fact that the levator palati was innervated by the nucleus ambiguus; also cases in which the vocal cord abductor paralysis had been associated with a lesion of the hypoglossal nucleus; and he thought these pointed to a central origin. There were also cases of persistent pulse-frequency occurring in the subjects of tabes who showed abductor paralysis. He did not think those cases were very rare, and hence in the first edition of his book he said one might almost lay down as a dictum that "*in the absence of febrile disturbance or other obvious cause (such as exophthalmic goitre), persistent increase of pulse-frequency associated with laryngeal abductor paralysis or paresis, points to bulbar nuclear degenerative lesions.*" The explanation was that it was due to associated degeneration of vago-cardiac inhibitory nuclei in association with degeneration of the nucleus ambiguus.

Mr. E. D. DAVIS asked whether there was any definite *post-mortem* evidence that apical pleurisy and tuberculosis were causes of right recurrent laryngeal palsy. He had done some *post-mortem* work on the question. In two cases there were enlarged glands in the mediastinum: One was a case of a child aged 12 months, in which there was no lesion of the larynx, and no paralysis had been observed; but the enlarged glands

had pushed the vagus forward, and so pulled upon the recurrent nerve. The nerve was nowhere in relation to the pleura or the mediastinal pleura. In the second case the gland enlargement was due to sepsis, and here again the vagus was pushed forward, and pulled on the recurrent laryngeal nerve. In the next two cases there were extensive adhesions at the apex of the lung from advanced tuberculosis, but the right recurrent nerve was not involved. In another case there was mitral stenosis with dilation of the auricle and considerable mediastinitis, and here again the left recurrent nerve was not implicated. Dr. Fetterolf and Dr. Norris of Philadelphia had shown that the dilated auricle might press the left pulmonary artery against the recurrent laryngeal nerve and the aorta, and so produce neuritis and paralysis of that nerve.

Mr. T. GUTHRIE remarked that Dr. Permewan referred to the fact that almost all the cases of recurrent paralysis which recovered belonged to the neuritic group. In some of those cases it was difficult to be certain that there had been such neuritis; at any rate there seemed to be no cause of neuritis in the patient. He referred to four cases, in all of which recovery ensued in from three to eight months. They were men ranging in age from twenty-five to forty-three. The paralysis was sudden in onset, and complete from the first. In two the larynx was in other respects normal apart from the paralysis; while in the others there was complete paralysis of one cord, accompanied by paresis of the internal tensor of the opposite cord. In three cases it was the left, and in one the right nerve was affected. In all cases the recovery was gradual, but complete. In one case the patient left home in the morning with a normal voice, bicycled a short distance to the station, and on arriving there was voiceless, in which condition he remained a fortnight. Mr. Guthrie saw him a fortnight after the occurrence, by which time the voice had begun to return. There was then complete left recurrent paralysis, with marked paresis of the right internal tensor. Possibly in this case the paralysis affected both nerves originally, but the right only slightly, and by the time he was seen the right had largely recovered. In none of the cases could the cause of the paralysis be discovered. He did not think any of the patients could be called rheumatic; nor was there evidence of toxic trouble.

Dr. JOBSON HORNE said that we could deduce from the tables of cases shown to-day the frequency of any one cause relatively to all causes of paralysis of a recurrent laryngeal nerve. From the standpoint of the practitioner, however, the determination of the relative frequency of unilateral paralysis of the recurrent laryngeal nerve as an outward and visible sign of any one disease, or of a phase of any one disease, would be of greater value. Such statistical tables at present are not available. Some years ago he had made a routine practice of examining and recording the condition of the larynx in all cases with symptoms suggestive of the possibility of thoracic disease. In 359 consecutive cases of pulmonary tuberculosis in which the larynx was examined, unilateral paralysis of the recurrent laryngeal nerve was met with in seven cases. In five of these cases the right cord was paralysed, and in four out of the five physical signs of pulmonary disease were found in the right apex. In the other two cases the left cord was paralysed, and in both there were physical signs of disease at the apex of the left lung. Although aneurysm of the aortic arch is the most common cause of paralysis of the recurrent nerve, nevertheless one ought to be cautious before basing a diagnosis of aneurysm upon symptoms of the disease coupled with this physical sign alone. The fact that aortic aneurysm cannot always be discovered

by means of the X rays further emphasises the importance of a routine laryngoscopic examination of obscure cases of thoracic disease.

Sir STCLAIR THOMSON said that one could not separate the clinical aetiology from the pathology of the subject: as that could not be done, the discussion that afternoon had not been as valuable as it might have been. Still, there was an improvement since the days of Avellis, when 50 per cent. of these cases were undiagnosed, and this improvement was largely due to the introduction of X rays and the recognition of paralysis in chronic bulbar lesions. Toxic causes had also been recognised ever since influenza had been so much with us. The association with cardiac enlargement was still open to discussion. There were still a large number of cases undiagnosed before the laryngologist would be able to help the physician, when he brought a case and was told there was recurrent nerve paralysis, and that he must examine the patient's chest and neck, and interrogate his nervous system. With regard to clinical aetiology, the table of Avellis referred to cases occurring "after operation for goitre," whereas in the table prepared by Dr. Permewan they were put down as "injuries during operations on thyroid gland." No doubt there was traumatism of the recurrent laryngeal nerve in some cases, but some of the cases were really "after operation," and not a consequence of direct injury during the operation. Where the nerve was afterwards found to be paralysed, the patient looked aggrieved and the surgeon was obviously disappointed, and yet it might have been no fault of the operator. Those cases were not examined with the laryngoscope soon after the operation, as they should be. He knew some cases in which the cords were freely moving a week after the operation, and later became paralysed. He found that this occurred in cases in which the neck wound did not heal by primary intention; they were cases in which the surgeon was compelled to put in a drainage-tube, or in which a stitch-abscess formed.

Dr. DUNDAS GRANT directed attention to one of the toxic forms of recurrent nerve paralysis. He had recorded two cases of alcoholic neuritis of the left recurrent laryngeal nerve. He took great care to exclude other causes in attributing the cause to alcohol, especially as these were exceptions to the general rule that toxic paralyses were bilateral. The cases were described in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, vol. xii, p. 540.

That kind of case he regarded as quite rare; he had not had other similar cases in his own practice. Alcoholic neuritis was generally bilateral, and the abductors were usually affected, so that the symptoms had generally been those of interference with respiration, whereas in his cases there was hoarseness. He had shown to-day a microscopical specimen from the case he brought forward at the March meeting,¹ showing giant-cells, in confirmation of the idea that it was due to a tuberculous lesion situated near the apex of the petrous bone. He had operated in the mastoid region, and found considerable tuberculous rarefaction of the petrous bone, and during scraping of the roof of the antrum there was a flow of pus from the interior of the cranium. Free opening of the cranium revealed a fungating growth, evidently tuberculous, on the surface of the dura mater, the size of half-a-crown, which confirmed the provisional diagnosis made when the patient was shown at the March meeting.

The alcoholic cases he mentioned earlier recovered.

¹ JOURN. OF LARYNGOL., RHINOL., AND OTOL., October, 1913, p. 550.

The PRESIDENT, during the past five years, had seen many cases of paralysis of the recurrent nerves. In some the cause was easy to determine, *e. g.* aneurysm, mediastinal growth, malignant disease of the gullet, etc., but in others the causative factor was indeterminable, and he had during the past three days been enabled to re-examine four of such cases, and three of them had completely recovered. He added that he had been brought up to regard paralysis of a vocal cord in an adult as a matter for a grave prognosis, but in the light of his own experience, and of such cases as had been recorded by the aforementioned speakers, he felt that recurrent paralysis should always suggest grave possibilities rather than probabilities.

DR. DE HAVILLAND HALL, in reply, related a case which Sir Felix Semon saw ten years ago. The patient came to see him (Dr. Hall) for life assurance. He had abductor paralysis of the left vocal cord; hence Dr. Hall could not recommend him for life assurance. He had to go to South Africa for business, and he came back a year later and insured himself, as he was well.

SIR DAVID FERRIER, in reply, said he wished he was able to answer all the questions which Sir Felix Semon had put to him, but he did not think this was possible in the present state of our knowledge. It was certain, however, that the extensor muscles were first involved where a peripheral mixed motor nerve was the seat of neuritis. Why this was so he could not say. Whether it depended on functional or reciprocal relationship, or the relative trophic strength in the nerve centres, the same thing happened to the posterior crico-arytenoid in case of neuritis or pressure on the recurrent laryngeal nerve. The point he wished to make in regard to tabes was that in the majority of instances there were clear indications of peripheral lesion. The cases in which central lesion had been described were vague, and the clinical symptomatology apparently so inconsistent, that he attached little importance to them. He thought the whole subject required re-investigation by modern methods. As to whether, in bulbar paralysis, the abductors were affected before the adductors would require examination at an earlier date than was, perhaps, usual: for, as was well known, the abductors might be paralysed before the voice was appreciably affected. He maintained, however, that on a due consideration of all the facts, tabetic laryngeal paralysis, in which the abductors only were paralysed, was most probably due to peripheral causes.

DR. PERMEWAN, in reply, said he had been much interested in the cases described by the President and by Mr. Guthrie, but he thought it would be dangerous if members had the impression that there were a very considerable proportion of cases of abductor paralysis which were simply due to a functional or neuritic cause, and were, therefore, recovered from. He feared it was likely that patients would often develop symptoms sooner or later of organic disease.

BRITISH MEDICAL ASSOCIATION.

Meeting at Brighton, July, 1913.

SECTION OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

A. J. HUTCHISON, M.A., M.B. (*Brighton*), *President, in the Chair.**Abstract Report by MR. HAROLD L. WHALE.*

The PRESIDENT, in opening, assumed responsibility for the choice of subject, "The Care of Patients after Nasal Operations," and quoted, in justification, two cases, one of tonsils and adenoids, in which operation was followed by pericarditis and multiple arthritis; the other of posterior turbinotomy, followed by abscess of the lung.

A temporary subacute otitis media is common, and graver issues include sinusitis, meningitis, and suppurative cervical adenitis.

Discussion on the Technique and After-treatment of the Radical Mastoid Operation.

I.—**William Milligan, M.D.** (Manchester), said that pre-operative labyrinthine tests should be routine. It is better not to operate at all than to perform *only* the radical operation where the functions of the labyrinth are actively impaired. Ruttin's test—that in a healed labyrinthitis after-nystagmus lasts as long towards the diseased as towards the sound side, but that both these are of shorter duration than normal—is useful to distinguish this condition from a latent diffuse serous labyrinthitis.

In operating on females, instead of shaving the scalp widely, the hair may be plastered down with collodion. To close off the Eustachian tube the galvano-cautery may be used, under direct vision through a Yankauer's speculum.

In contra-distinction to an ordinary skin-flap, the new periosteal flaps are more likely to slough. The gouge, worked by hand alone, especially in infantile bones with dense cortices, is inferior to the gouge and hammer, supplemented by the burr.

Scraping away the mucosa over the promontory, and so replacing the former with cicatricial tissue, is deprecated unless all hearing had previously been lost.

The first packing may be left in for four days. Later, to encourage epidermisation of the cavity, "cell-proliferants" such as scarlet-red, skin-grafting, or blood-clot dressing may be adopted.

Dr. DUNDAS GRANT referred to the occasional formation of a web over the antrum during healing. What is the relative frequency of post-operative meningitis?

Dr. WILLIAM HILL advocated a light packing with plain gauze and insisted on the thorough removal of granulations from the tympanic orifice of the Eustachian tube, and recommended painting the meatus with iodine immediately after operation.

Sir ROBERT WOODS approved of immediate grafting. The use of hydrogen peroxide risks the spread of sepsis.

Dr. JOBSON HORNE urged simplicity in technique and after-treatment.

Dr. NEIL MACLAY urged the necessity of dealing with the Eustachian orifice.

Dr. WATSON-WILLIAMS preserves the tympanic mucosa in cases with fair hearing-power, and has had fairly good results with the double skin-flap.

Dr. WYLIE said it is important, although difficult, to make the patient lie on the diseased side after operation for purposes of drainage. Granulations could be treated by the cautery or trichloroacetic acid.

Dr. W. S. SYME prefers to close the Eustachian tube not only at its tympanic, but also at its pharyngeal end.

Mr. E. D. DAVIS, in urging the importance of examining the labyrinth before operation, quoted a case of subdural abscess and another of diffuse meningitis subsequent to operation.

The PRESIDENT had had good results with allantoin in cases which were slow to granulate.

Dr. MILLIGAN replied.

Discussion on After-treatment and Complications of Operations on the Nose and Naso-pharynx.

Mr. Herbert Tilley said the galvano-cautery should never be used in nasal fossæ so narrow that adhesions might form. Before an anterior turbinectomy the vestibule might be painted with iodine.

In the dangerous bleeding sometimes following posterior turbinectomy morphine, hypodermically, is useful. When, after a submucous resection of the septum, this remains lax and vibrates with respiration, a large hole may be deliberately cut in the septum. The nozzle of any syringe used should be sufficiently narrow for an easy return-current of lotion. After ethmoidal curettage two of his earlier cases had developed an orbital abscess.

After a Caldwell-Luc operation the most dreaded complication is a crust forming a complete cast of the antrum, for which he applies strong silver nitrate solution.

After washing out a frontal sinus the cavity should always be blown out with warm air.

After adenoid curettage hæmorrhage is usually due to the remains of a tag. An important item in after-treatment, where the chest has become deformed, is breathing-exercises.

Sir Robert Woods preferred cocaine to any general anæsthetic; before cocainisation, a full meal tends to the avoidance of syncope. For bleeding, calcium lactate is useful, or if from venous engorgement, digitalis.

After turbinectomy, pharyngitis sicca is not a complication, but a natural result, and the operation should be avoided.

Dr. W. H. KELSON urged the routine examination of the urine in all patients of middle age, thus forewarning the surgeon of the likelihood of bleeding or sepsis.

Dr. JOBSON HORNE preferred to keep the patients in bed or their rooms for a few days after an operation.

Dr. SOMERVILLE HASTINGS advocated the use of sodium salicylate or aspirin.

Dr. WATSON WILLIAMS preferred his method of frontal sinus opera-

tion to that of Killian, because an aberrant infected cell is less likely to escape notice.

Mr. MAYO COLLIER deprecated extensive post-operative douching. The stream of respired air was the best antiseptic and styptic.

Mr. W. S. SYME, at the conclusion of a maxillary antrum operation, sprays through the cannula with cocaine and adrenalin.

Prof. WHEELLOCK paints the operation area, after cocainisation, with argyrol.

Dr. KILLEN, for septal operations, uses *injections* of novocain.

Mr. HERBERT TILLEY and Sir R. WOODS replied.

Rhinoscleroma.—Owen Richards.—Rhinoscleroma is neither an English nor a tropical disease. It is common in Egypt. The nose, while increasing vastly in bulk, retains its form. The lachrymal ducts and Eustachian orifices may become blocked. The jaws and face appear able to resist.

An organism has been isolated from a culture in which it is mixed with *Diplococcus catarrhalis* and diphtheroid organisms: the tube containing the emulsion requires prolonged agitation, because the growth is so viscid. A vaccine had been made and so far proved useless.

Dr. WILLIAM HILL inquired whether gamma radiation had been tried for this condition.

Suggestive Points of Analogy between Otosclerosis and Arthritis Deformans.—John O'Malley, F.R.C.S.—Otosclerosis is stapedio-vestibular osteo-arthritis. In the morbid changes of chronic hyperplastic otitis media there are two outstanding features—simultaneous and alternating hypertrophy and atrophy, both of these being active processes. The essential underlying pathogenic factor must be nutritional.

The Anatomy and Comparative Anatomy of the Palatine Tonsil and its rôle in the Economy of Man.—H. Seccombe Hett, F.R.C.S.—Carnivores have projecting tonsils; herbivorous animals' tonsils are submerged. The human tonsil is a mixture of these two.

The normal human tonsil begins to atrophy at five years of age, and, being fully atrophied before adult life, cannot have a function in adults.

Mr. H. G. BUTTERFIELD: The perivascular lymphatics at the hilum of a tonsil associated with cervical adenitis are found full of micro-organisms.

Mr. E. D. DAVIS referred to the defensive rôle of the tonsils.

Dr. JOBSON HORNE considered the tonsils to be the first line of defence.

Mr. O'MALLEY asked whether Mr. Hett had found cervical adenitis after enucleation of tonsils.

Demonstration.

Tracheal Administration of Anæsthetics.—Dr. WILLIAM HILL showed his gum-elastic intra-tracheal catheter. A rubber shoulder 3 in. from the end rests on the ventricular bands, preventing the ingress of blood into the larynx. This avoids laryngotomy, tracheotomy, or Kuhn's cumbersome apparatus.

Dr. G. BARTON approved of this apparatus, quoting a case where its use might have avoided death from asphyxia.

Dr. E. D. DAVIS also had used a catheter passed through the nose into the trachea.

THE AMERICAN LARYNGOLOGICAL
ASSOCIATION.

The President, DR. GEORGE A. LELAND, in the Chair.

Report by DR. EMIL MAYER.

Monday, May 5, 1913.

Migraine and Sphenoidal Sinus Disease.—Greenfield Sluder.
—In a previous communication (last May), in which the question was raised as to the ætiology and treatment of migraine, Sluder made the statement that many of the recurrent headaches which bear the name of migraine are sphenoidal empyemata which have lost most, if not all, local signs, or which were started as such empyemata, and that the nerve-trunks had become involved either by extension of the inflammation (or its toxin) through the thin wall separating the sphenoidal sinus from the adjacent nerve-trunks. Sluder observed that the third, fourth, and three divisions of the fifth, sixth and Vidian frequently lie in close association to the sphenoidal sinus—a deduction drawn from specimens which he studied by cross-sections. His findings, with the exception of the Vidian nerve, were corroborated by Ladislaus Onodi (*Archiv für Laryngologie*, Bd. vi, Heft 2, July 10, 1912). This author's method was to follow the nerve-trunks in certain specimens, sometimes to remove the wall of the sphenoidal sinus, and then to study the relations of the nerve-trunks thereby exposed. He found that they were in these close associations for varying distances, sometimes even as much as 20 mm. He did not consider the cavernous sinus in these relationships. He pictures specimens where the sphenoidal sinus extended so close to the clivus of Blumenbach as to make transparency of the separating bone, and shows how this brings the sixth into these associations. From an inspection of specimens showing the nose and accessory sinuses from the eighth week of foetal life to the twenty-fifth year, Sluder observed that the sphenoidal sinus spreads laterally at an early age, reaching to close proximity to the second division of the fifth as early as two and one half years, and that this condition runs almost constant throughout the series. Its development (Davis) begins in the antero-lateral aspect of the body, and slowly extends backwards, spreading, however, rapidly laterally to approach the foramen rotundum, and then proceeding backward. As early as the sixth year the Vidian canal may be approached. Sluder considers that if he is right in the conclusion that the mode of production of these headaches is the close association of the sphenoidal sinus to the nerve-trunks, and that the inflammatory processes are transmitted through the thin bone separating the cavity of the sphenoid from the associated nerve-trunks, then it is necessary that such anatomical associations be formed in early life as an explanation of such headaches beginning in early life. Another year of clinical observation strengthens Sluder's belief that the pathological process underlying these cases is a hyperplastic sphenoiditis. From an observation of 100 cases he concludes that the second division of the fifth and Vidian are the nerves most frequently involved (95 per cent.). They may be involved singly, or together, then making the picture which would otherwise emanate from the sphenopalatine ganglion. It is difficult to differentiate this class of

cases from sphenopalatine ganglion neuralgia; hence one should be carefully on guard. The drugs which have so far proved of greatest benefit are: One per cent. carbolic acid in oil; 2 to 10 per cent. oil of winter-green and aqueous solutions of sodium salicylate, 2 to 5 per cent. These have been successful in allaying the pain long after the sinus was satisfactorily opened and the wound healed.

Ulceration of the Larynx, with Exfoliation of Cartilage from Typhoid Fever.—J. H. Bryan.—The frequency of this complication in typhoid fever in Europe, according to Landgraf, is 11 per cent. of all fatal cases; according to Griesinger, 26 per cent.; Kanthack, 26 per cent.; Ouskow 40 per cent. It is difficult to arrive at any conclusion as to the frequency of this complication of typhoid fever. The figures given by Jackson seem to show that a much larger number of cases of laryngeal involvement occur in America than is indicated by the figures given by Thomson. The epidemic in which Jackson made his observations was, however, an unusually severe one, and the subjects were largely of a poorly nourished type, and this may account for the apparently greater frequency of this complication in this country. We cannot get at the truth in this matter until more careful observations are made, not only in the hospitals, but in private practice as well.

Thyrotomy for Cancer of the Larynx.—D. Crosby Greene.—In a paper presented to this Association in 1906, the results of an investigation of the lymphatic drainage of the larynx by means of submucous injections of methylene-blue and mercury were reported. The results obtained are confirmatory of those reported by others in showing that the network of lymphatic vessels which extends beneath the mucous membrane throughout the interior of the larynx is richer in the number and size of the vessels in the supraglottic region, relatively poorer in the subglottic portion, while on the vocal cords the vessels are very small and widely separated. These anatomical facts account for the slow growth and late development of the disease in the cervical lymphatic glands in cases of epithelioma of the cords. Certain details of the technique of thyrotomy have an important bearing on the immediate and after-results of the operation. The steps of the operation are: (1) Ether by inhalation preceded an hour before by $\frac{1}{4}$ gr. of morphine and $\frac{1}{150}$ gr. of atropin. (2) With the head slightly extended a median incision is made extending from the lower border of the hyoid bone to the lower border of the cricoid cartilage. This incision is carried down until the thyroid and cricoid cartilages and cricothyroid membrane have been definitely exposed. (3) A 1 per cent. solution of cocaine is injected through the cricothyroid membrane into the cavity of the larynx. (4) The patient is now placed in the Trendelenberg position and a thick pad placed under the shoulders to bring the larynx into prominence. (5) The cricothyroid membrane is next incised in the median line, and through this incision a swab of 10 per cent. solution of cocaine is introduced and applied to the laryngeal mucous membrane. (6) The thyroid cartilage, after a pause of five minutes, is divided from below upwards. In young subjects this may be done with a knife, but in the majority of cases where the cartilage has become ossified, it is best to use strong curved scissors with dull points. (7) The thyroid wings are now widely retracted and an examination of the growth made under good illumination. (8) Beginning at the free margin of the thyroid cartilage, on the affected side in front of the growth, the internal perichondrium is elevated from off the cartilage with

a sharp elevator from before backwards to a line well behind the limits of the growth as well as above and below it. All the soft structures are thus freed from the underlying cartilage. (9) Parallel horizontal incisions are now made with scissors above and below the growth. These incisions are carried about half an inch behind the posterior limit of the growth. (10) The growth with its surrounding tissue is now entirely removed with a wire snare by which the posterior attachments are severed. When the growth is so extensive, even though confined within the cavity of the larynx that the larynx cannot be opened without cutting into the growth, recurrence is not only possible but probable.

Decannulation and Extubation after Tracheotomy and Intubation respectively.—**Chevalier Jackson.**—The different forms of laryngeal stenosis associated with difficult decannulation or extubation may be classified into the following types: (1) Pain: Breathing through the neck with a properly placed tracheotomy cannula is so much easier than breathing through the mouth, that once the patient becomes accustomed to it for quite a while he does not feel that he is getting enough air through the mouth, even though the larynx is perfectly patulous. In addition to this there is a nervous habit arising from previous experience with the stenosis that terrorises the patient the moment he feels the slightest dyspnoea. (2) Spasmodic: This form of stenosis may be associated with panic, or may be excited by subglottic inflammation. It is usually overcome by the same means as those suggested for panic, together with the treatment of inflammatory conditions that may be present. Doubtless one of the chief causes of adductor spasm is the prolonged wearing of the intubation tube. (3) Paralysis: Bilateral ankylosis of the crico-arytænoid joints may prevent decannulation until the laryngeal stenosis is relieved. This operation is not to be advised except in such cases as have remained rigid for a period of twelve months or more, and this is not meant to include the fixation that is associated with malignant, tuberculous, or luetic infiltrations. (4) Neoplasms: Decannulation in neoplastic cases will depend upon the nature of the growth and its curability. (5) Hyperplastic. (6) Cicatricial: (a) Loss of cartilage; (b) loss of muscular tissue; (c) fibrous. The hyperplastic and cicatricial types of organic stenosis preventing decannulation may be classified as follows: (1) Tuberculosis. (2) Lues. (3) Scleroma. (4) Acute infectious diseases: (a) diphtheria; (b) typhoid fever; (c) scarlatina; (d) measles; (e) whooping-cough. (5) Decubitus: (a) Cannular; (b) tubal. (6) Trauma: (a) tracheotomic; (b) intubational; (c) operative; (d) suicidal. Conditions outside of the paralytic and neoplastic forms are almost all the result of inflammation, often with ulceration and the secondary tissue changes. In the infective granulomata it is practically always the mixed infections from oral sepsis that do the harm. The chief exception to this is diphtheria, which is in many cases a distinctly necrotic process. In the rare cases in which laryngeal tuberculosis of such a severe type as to require tracheotomy is cured, decannulation presents little difficulty after the infiltrations are reduced. The reduction of these infiltrations by the galvano-cautery through the laryngeal speculum is readily accomplished. Should cicatricial stenosis from ulceration remain, it is to be treated in the same way as cicatrices from other causes—by laryngostomy. In those old cases of luetic fibrosis little amenable to the older methods of treatment salvarsan has accomplished wonders. Emil Mayer has recommended the use of radiotherapy in the treatment of scleroma. So far, however, the results have been so

unsatisfactory that they practically constitute the only cases in which decannulation is impossible. When typhoid fever was prevalent in Pittsburg, it was found that the ulcerative lesion in the larynx was practically always the result of mixed infection, but in some instances it was due to thrombosis of a small vessel with subsequent necrosis. The after-treatment of these cases is chiefly by prolonged intubation, and in some cases by laryngostomy. Scarlet fever may be followed by acute laryngeal stenosis which is cicatricial. Occasionally foreign bodies may ulcerate through from the œsophagus into the trachea. A properly fitting tube will not cause any ulceration, if it is free from roughness or sharp edges and is removed sufficiently often to be cleaned. For diphtheria and like conditions he had never seen any improvement on the original O'Dwyer apparatus. When a tracheotomised case reaches the stage when it is to be trained to breathe through the mouth, it is necessary to occlude the cannula. For the reduction of exuberant granulations nothing has yielded better results than resorcin. As a stimulation to epithelialisation the German preparation scarlet red in a sterile 20 per cent. mixture has yielded excellent results during laryngostomy.

Congenital Occlusion of the Post-nasal Orifices.—Charles W. Richardson.—In July, 1912, a case came under observation in which there was complete osseous obstruction of the post-nasal orifice at as early a period in the life-history of the patient as any observer has noted such a condition. Only a few cases are recorded in which the obstruction was observed in infancy. It is not possible to tabulate all the cases recorded in the literature, but they do not exceed 100. The obstruction of the post-nasal orifice may be membranous or osseous. The former are usually found posterior to the nasal cavities in the naso-pharyngeal cavity, but lie in contact with the post-nasal orifices so as to obstruct them completely, while the latter are usually placed within the chamber a millimetre or more from the free border of the posterior nasal orifice. To these two forms may be added congenital atresia, by which the bones entering into the formation of the post-nasal orifice become united, thus more or less completely obstructing the post-nasal orifices. The child under observation had marked difficulty in breathing. It struggled for air and the face became suffused and slightly cyanosed, the condition being relieved when it began to cry. Whenever it ceased to cry there would be a recurrence of the difficult breathing. Examination demonstrated complete obstruction of the post nasal orifices. By the end of the second week the child learned to maintain mouth-breathing, and also learned to feed in a short time, and has developed in a normal manner. The question is: When is the proper time to operate? The marked success with this case seemed to favour the expectant surgical policy in these cases.

Foreign Bodies in the Œsophagus.—Cornelius G. Coakley.—The first patient, a boy, aged sixteen, thought he had swallowed a piece of plate in his soup. He had a temperature of 105° F., rapid pulse and pneumonic area in the right lung, when first seen. Examination of the pharynx showed œdema extending from the vault of the naso-pharynx as far down as one could see with the laryngeal mirror, or feel with the fingers. It much resembled a retropharyngeal abscess. The X ray showed a triangular foreign body. It was jagged, and evidently had cut into the mucous membrane so as rapidly to infect the pharyngeal mucosa, and the secretion from the infected pharynx passing into the larynx, setting up a septic pneumonia within twenty-four hours. The boy died

fourteen hours after the operation from acute septic pneumonia. This case shows the necessity for the prompt operative relief for removal of sharp foreign bodies. The same day a boy was seen, three years of age, who had swallowed a coin. The X ray showed the coin at the level of the sixth cervical vertebra. The child had no symptoms. The coin was removed by operation and the child suffered no subsequent discomfort. In this instance the coin had been in position for five days before it was removed.

Symposium on Phlegmons of the Upper Respiratory Tract: Report of a Case.—F. E. Hopkins.—This case illustrates the possibility of erosion of a large blood-vessel. The patient was a male, aged twenty-six, of poor resistance, because of leading an irregular life and having had a recent acute illness. He had suffered from measles and while convalescing took cold. There was marked swelling on the left side with severe pain, but the patient was not prostrated, and at no time did his temperature go above 101° F., or his pulse above 80 or 90. Deep incisions were made, but these yielded no pus, and there was no evidence of pointing. Two days later a hæmorrhage occurred which was controlled by pressure. On the following day a terrific hæmorrhage occurred and quickly proved fatal. Such an examination as could be made immediately following death showed rupture through the posterior pillar, the flood from an eroded carotid finding exit there. Such a mass of cellular infiltration should be explored with a blunt instrument, even the finger, following unfruitful incision. The wonder is not that phlegmons threatening life occasionally develop, but rather, considering the frequency with which infections of this region occur, that they are so rare that an active professional life may pass and not a single one come under observation. Microscopic findings are of little value in determining the treatment of these cases. Early and effective drainage is the best assurance of a favourable result. Suffocation from flooding of the larynx by the sudden rupture of an abscess has been reported, and tracheotomy has been required because of closure of the pharynx by infiltration and oedema.

Inflammation of the Lateral Columns of the Pharynx leading to Abscess Formation.—Henry L. Swain.—Any isolated mass of lymphoid tissue can in a general way be expected to act when inflamed exactly after the fashion of the faucial tonsil. The adenoid or pharyngeal tonsil may show acute as well as chronic inflammation. The same is true of the lingual tonsil. If we continue to remove root and branch from young children all of their adenoids and faucial tonsils, there will be abundant need to devote more and more attention to these masses of lymphoid tissue as well as to the lingual tonsil. In years gone by, when adenoids were removed from children and the faucial tonsils were left untouched, the latter subsequently enlarged into a perfectly healthy growth, as though needed by the system. If the faucial tonsils are ruthlessly removed, there will be enlargement of the lingual tonsil or lateral columns of the pharynx, as there has been of the faucials following the older simple adenoid operation. If this is logically true we will find not only acute inflammations of these structures, but also phlegmons. We have assumed more or less arbitrarily that as the lateral column of the pharynx is no mean mass of lymphoid tissue, and as it has been known to have all other kinds of inflammation to which lymphoid tissue is heir, we have a logical right to expect that there may also be the phlegmonous type. He recently had had six cases of oedema of the

larynx, in two of which there was no quinsy at all. There was inflammation of the lateral column of the cord (? pharynx.—ED.) in both these instances, and there was in one a marked general, what may be called rheumatic, infection, where various joints of the body were affected, but with no persistence of the symptoms in any one place for any length of time. In these various cases of oedema one has to look to some other cause than pressure.

(To be continued.)

MEETING OF THE GERMAN OTOLOGICAL SOCIETY.

Stuttgart, May, 1913. (*Monatss. f. Ohrenh.* Year 47, No. 7.)

Abstract Report of Proceedings.

Closure of the Eustachian Tube with a Horn Peg.—Laurowitsch (Jena).—This method had been used as a routine procedure by the author with extremely satisfactory results in his radical operations. It was also most successful as a means of checking a persistent discharge due to a purulent condition of the tube in cases operated on previously and otherwise healed.

Experimentally produced Occupational Deafness.—Hoessli (Basel).—The author has continued his research in this direction (see vol. lxiv, *Zeitschrift f. Ohrenh.*), and has come to the following conclusions: (1) If the incus is removed from one ear of the animal (guinea-pig) under investigation this labyrinth shows no change after ten weeks' residence in the copper kettle, whilst that of the sound ear on the opposite side becomes the seat of advanced destructive processes. (The copper kettle, which constitutes the cage in which the animals are kept, is essentially a cylinder of metal on which four small mechanically driven hammers strike.) (2) If the middle ear has been damaged by inflammatory or adhesive conditions, the labyrinth on this side, in a similar way, is unaffected. (3) If the animals were insulated within the cage by means of a 2 cm. thick piece of felt they suffered in the same way as the controls not so insulated. (4) The degenerative process commences in all these tests in three to four weeks. The conclusion is that air-conduction plays by far the greatest part in the production of occupational deafness, and that any interruption of this route tends to protect the termination of the cochlear nerve.

Disturbances of Hearing and Equilibration in Lues.—O. Voss. (Frankfurt-a-M.).—(1) Lesions of the inner ear occurring in the course of lues are almost without exception the result of the disease. (2) The more common occurrence of such lesions during the secondary stage of the illness since the introduction of Ehrlich's salvarsan is due to the insufficiency of the dose administered. (3) The basis of the histological changes is the effect of a coincident cerebro-spinal meningitis of luetic origin. (4) These consist in a neuritis of the cochlear nerve, and in inflammatory changes in its peripheral end-organ. (5) The site of the

affection may be single or multiple. (6) The diagnosis of syphilis is dependent on the characteristic functional affection of the cochlear and vestibular nerves, the presence of other luetic symptoms, especially the inflammatory changes in the cerebro-spinal fluid, and lastly by the improvement and eventual cure under suitable treatment. (7) The prognosis in the early stages of the disease is the more favourable the earlier and more energetically the treatment is adopted. In the tertiary stages degenerative nerve-lesions are most unfavourable, but even in these, at times, some improvement results. (8) The best treatment is an energetic combination of salvarsan and mercury, with the assistance of iodides and diaphoretics internally. (9) The dosage of salvarsan varies, and is regulated by the disappearance of the auditory and static disturbances, and of the inflammatory signs in the cerebro-spinal fluid, and the result of the Wassermann reaction. (10) With proper care injurious effects need not be feared, but in a very few cases peripheral neuritis does occur, as has also been observed in connection with other arsenical compounds. There had been no cases of central lesions.

Alex. R. Tweedie.

Abstracts.

NOSE.

Mackintosh, A. H. Grant.—A Case of Acute Nasal Catarrh due to a Gram-negative Bacillus resembling the "Distemper" Group of Organisms. "*Lancet*," December 14, 1912, p. 1647.

The bacillus was isolated from a patient complaining of an acute febrile catarrh, with thin, watery, nasal discharge. The latter contained numerous pus-cells and abundance of bacilli. A Gram-stained film showed a few bacilli of the Hoffman type, a very few cocci, and a great number of Gram-negative bacilli arranged in twos, of considerable variation in size. Various cultivations are described, with inoculations on guinea-pigs and rabbits. The bacillus was one of the group classified by Hueppe in 1866 and named the bacilli of hæmorrhagic septicæmia. The patient had not been in contact with animals infected with distemper and made a rapid recovery, the course of the disease resembling that of an ordinary cold.

Macleod Yearsley.

Schönfeld, Walther (Gersfeld).—Hyperplastic Œdematous Rhinitis (Seifert). "*Zeitschr. f. Laryngol.*," Bd. v, heft 2.

Chronic hyperplasia of the inferior turbinal may occur in snuff-takers—almost invariably males. The hyperplastic tissue is pale and gelatinous and usually smooth. The secretion is transparent. The swelling of the turbinal does not go down under cocaine, and therefore cases should be treated by resection.

J. S. Fraser.

Dunbar, W. P.—The Present State of our Knowledge concerning Hay-fever. "*Annals of Otol., Rhinol., and Laryngol.*," vol. xxi, p. 279.

A moderately long paper summarising the work which has been done by the author and others from 1902 to the present time. He discusses the history of the neurosis from the case described by Benningerus in

1673, and the remarks of Heberden a hundred years later. Dunbar deals with aetiology and relates his own experiments. It is pointed out that in every case a clear-cut diagnosis should be made to avoid unsatisfactory results, and this should be done by means of the toxin reaction. A hay-fever patient reacts to one drop of a 1:200,000 solution of pollen albumen placed on a mucous surface. The question of treatment by antitoxin is gone into minutely, with the general lines which have been adopted for treatment. The whole paper is one which should be read *in extenso*.
MacLeod Yearsley.

Orleanski, K. (Moscow).—A Case of Supernumerary Tooth in the Nasal Cavity. "Zeitschr. f. Laryngol.," Bd. v. Heft 2.

The patient was a female, aged twelve, who complained of nasal speech, foetor and crusts in the nose, the sensation of a foreign body in the mouth, and the passage of solid and liquid food into the nose. *On examination*, Orleanski found in the middle line of the hard palate an oval opening which led into the nasal cavities and had smooth cicatricial edges. In the anterior part of this opening lay a tooth with its crown downwards and forwards. Nasal examination showed a large perforation of the septum and foetid crusts; a history of two years' purulent rhinitis was obtained, and the nasal condition was diagnosed as due to syphilis. (The Wassermann reaction is not recorded.—*ABS.*) The naso-buccal fistula had only been present for one year. Orleanski thinks that the tooth (an upper left eye-tooth) had been lying in the nasal cavity, and that the gumma of the septum and palate had allowed it to come partially into the mouth.

The author has collected thirty-four cases of teeth in the nasal cavity, and divides them into two groups—(1) those in which the "nasal" tooth is absent from the row, and (2) those in which it is supernumerary. The present case is one of this group, and ten others are recorded. With regard to aetiology of group (1) the condition may arise from (*a*) a rotation of the tooth-germ, (*b*) too early closure of the alveolar margin, (*c*) want of sufficient room for eruption. Aetiology of group (2): (*a*) The milk-tooth has remained in the alveolus and formed an obstacle to the eruption of the permanent tooth; (*b*) Developmental anomaly of the dental germ.
J. S. Fraser.

Lang, Johann.—Atresia of the Choanæ and the Influence of Heredity thereon. "Monats. f. Ohrenheilk.," Year 46, No. 8.

Based on reports of six cases which came under his immediate observation the author reviews this subject at length in an exhaustive article, concluding with a list of over a hundred references to various writers.

He considers there is good evidence to show that the anomaly tends to occur in certain families.

After discussing the development of the parts concerned with a view to determining the morphological origin of choanal atresia, the two following possibilities are submitted as a solution: Either the atresia occurs independently and posteriorly to the bucco-nasal membrane, or the persistence of this latter structure itself forms the occlusion and its site the ultimate anatomical choana in association with a perverted development of the palate and nasal septum.

The relation of the various facial and cephalic indices to the condition in question are also surveyed.
Alex. R. Tweedie.

Albanus (Hamburg).—The Pathogenesis of Lupus of the Nasal Cavities and its Relation to Neighbouring Parts. "Archiv f. Laryngol." vol. xxvii, Part II.

Statistics showing the frequency of the association of lupus of the nasal mucous membrane with lupus of the skin vary greatly according to the nature of the material investigated. Thus Bender, among 380 cases of cutaneous lupus, found the nasal mucosa involved in one third, while among sixty-five cases examined by Safranek no less than 72.3 per cent. showed the nasal affection. In most cases it is not stated whether the disease was present on the skin of the face or of some other part of the body. The author himself examined 147 cases of lupus of the skin and found the nasal mucous membrane involved in 46 per cent. This was the case in 15 per cent. of those with lupus of the extremities, 56 per cent. of those with lupus of the head, and 87 per cent. of those with lupus of the outer surface of the nose. It is clear, therefore, that in by no means every case of lupus affecting the exterior of the nose has the disease originated in the nasal mucosa.

The author's observations agree with those of Mygind in showing the much greater frequency with which the septum and the inferior turbinal are affected than other areas of the nasal interior. This fact may be regarded as an indication that a considerable proportion of intra-nasal lupus is due to infection reaching the nose by contact or by the air-stream.

All the possible modes of infection and spread of the disease are described and most of them are illustrated by cases from the writer's practice. Recent observations have shown that tubercle bacilli are circulating in the blood of many children in the complete absence of all symptoms, and cases in which numerous discrete foci of lupus appear on the skin and mucous membranes are certainly to be attributed to embolism resulting from this condition of bacillæmia. Acroërogenous and contact infections are much favoured by the presence of eczema of the nasal vestibule or rhinitis sicca anterior. This form of the disease appears to begin most commonly in adults on the skin of the ala, in children at the point of junction of skin and mucous membrane in the "nasal pocket." Spread of the disease by way of the lymphatics may take place either in the direction of the lymph-stream or against it; the author has been struck by the relative frequency of retrograde extension.

In conclusion, the author states his belief that while the importance of the nasal mucosa as the seat of the primary infection in lupus of the skin has certainly been under-estimated by some dermatologists, it has perhaps been exaggerated by some of those who have approached the question from the point of view of the rhinologist.

Thomas Guthrie.

EAR.

Goldstein, Max A.—Diseases of the Ear which lead to Brain Abscess.
"Journ. Amer. Med. Assoc.," September 21, 1913.

Either an acute or chronic suppurative otitis media may give rise to a brain abscess, but the distinction is of no practical value, as the seriousness of the lesion depends upon the virulence of the invading micro-organism.

Until recently brain abscess was regarded as a complication almost exclusively of the chronic forms of suppurative otitis media, but further studies have shown that the acute processes are also agents in the production of brain abscess, and it is in the acute types that the more typical development of brain abscess occurs. The extension of disease from its primal focus in the middle ear to the surrounding intra-cranial areas is greatly favoured by dehiscences in the tegmen tympani or tegmen antri: by the knee of the lateral sinus encroaching markedly on the mastoid antrum; by the floor of the tympanum being incomplete and imperfect, and in close touch with the jugular bulb; by the patency of petro-mastoid, and petro-squamosal sutures; and by the anomalous course of vessels throughout these areas.

Birkett (Rogers).

Dercum, F. C.—Diagnosis and Localisation of Brain Abscess. "Journ. Amer. Med. Assoc.," September 21, 1912.

In the diagnosis of brain abscess the existence of an otitis media, either past or present, is of the utmost significance. The symptoms may only appear years after the aural infection, in fact, a brain abscess, the symptoms of which become manifest in adult life, may have had its inception in an ear disease of childhood. Headache, vomiting and hebitude are the first signs that a brain abscess has become active. Soon after, dizziness, subnormal temperature or moderate fever, optic neuritis, neuro-retinitis and choked disc make their appearance. These symptoms have additional value in the presence of a high leucocytosis, and a negative cerebro-spinal fluid. If in a case of ear disease convulsions supervene, the suspicion of otitic brain disease should at once be aroused. The important differentiation in otitic abscess is between temporal and cerebellar involvement, but unfortunately symptoms pointing to such differentiation may be entirely absent. In the majority of cases symptoms are present, though they are often exceedingly slight.

Birkett (Rogers).

McKernon, James F.—The Operative Treatment of Brain Abscess of Otitic Origin. "Journ. Amer. Med. Assoc.," September 21, 1912.

McKernon lays down the following rules for the treatment of otitic brain abscess:

In acute and emergency cases operate early, doing the entire operation at one sitting. In subacute cases and those not urgent the modified decompression operation of Ballance with a wait of from twenty-four to forty-eight hours after the dural incision before exploring the brain conserves the best interest of the patient, and minimises the development of secondary meningitis. A large opening in the skull is essential. Dural sutures aid materially as flat retractors, and should the exploration be negative the brain-substance can be covered and protected by tying the sutures. If pus is encountered sutures are removed.

The knife only is to be used for incising brain-tissue; avoid finger manipulation and trauma to surrounding substance. Wipe the cavity gently; no irrigation should be used unless in a chronic abscess cavity with distinct and dense membranous wall. The size of the drainage-tube should be governed by the extent of the cavity; the material used is rubber tubing in the chronic variety and cigarette drain in the acute type.

Rise of temperature or change in mentality of the patient calls for an

immediate inspection of the cavity, with search for obstructed drainage or development of additional foci.

Rapidity in operations is essential to success, and above all frequent manipulation of brain-substance should be avoided.

Birkett (Rogers).

Berlstein and Novicki (Lemberg).—A Case of Tumour of the Eighth Nerve. "Monats. f. Ohrenheilk.," Year 47, vol. iii.

Emily S.—, aged twenty-one, applied for relief of severe headache, from which she had suffered for two years, at the General Hospital in Lemberg, January 11, 1912.

Her history revealed nothing important. The headache was not local, but was almost continuous night and day, causing sleeplessness for the first months after its onset. For the last year she had had attacks of giddiness associated with vomiting and malaise, and her hearing began to be affected, being accompanied by tinnitus, which after some months ceased. During the last three weeks the vision had been worse. No trophic disturbance. She had had one fainting attack, which lasted an hour. Chest and abdomen normal. Wassermann reaction negative. No ataxia. Diadokokinesis normal. Gait uncertain, with tendency to fall to the right. Tendency to fall backwards during Romberg's test. Achilles reflex absent on the left, and only elicited with difficulty on the right. Babinski absent. Otherwise all reflexes, sensation and movements normal.

Examination of the ears: Membrana tympani and middle ear normal both sides. Weber to the left. Rinne, right negative, left positive. Schwabach, right, markedly; left, slightly shortened. C, c₁, A₁ not heard right, left normal for all forks. With the noise apparatus only loudest conversation heard right. Spontaneous rotatory nystagmus to the left. Vertical nystagmus on looking down. No reaction to either cold or hot caloric test right, nor was the spontaneous nystagmus or the tendency to fall affected. Irrigation of the left ear with cold water induced a horizontal rotatory nystagmus in 25 seconds, which lasted 5 minutes and completely mastered the spontaneous nystagmus, accompanied with a typical tendency to fall to the left in varying positions of the head. Simultaneous cold irrigation of both ears resulted in a coarse nystagmus to the right after 50 seconds. Rotation to the left gave a horizontal nystagmus to the right of 8 seconds' duration; right rotation gave a horizontal nystagmus to the left lasting 35 seconds, which could easily be distinguished from the spontaneous nystagmus. Galvanic reaction, cathode on right ear, anode in left hand, evoked with 5 m.a. some nystagmic movements to the right. Cathode on left ear, anode in right hand, caused an active nystagmus to the left with 2½ m.a. With the divided monopolar electrode, cathodes in the ears, anode on the forehead, resulted in nystagmic movements to the left with 3 m.a. Giddiness occurred from time to time, especially with change of position. Malaise was less frequent than formerly, and was almost always associated with severe attacks of headache. No tinnitus.

No spontaneous deviation, but cold irrigation of the left ear gave a typical deviation to the left: similar test of the right ear did not affect the pointing at all.

The patient was examined three times within a week, and the same reactions essentially resulted; the spontaneous nystagmus, however, varied in intensity and direction. No positive help was obtained from an X-ray picture.

Eyes: Finger counting at 15 cm. left, vision $\frac{6}{12}$ right, oedema of both discs. No field could be mapped for the left eye; on the right side only the inferior temporal quadrant was preserved. Red was only detected at the centre, whilst for green a relative central scotoma existed.

An operation was performed in two stages. After the first—decompression—the patient was not improved, and fingers could only be counted at 5 cm. At the second operation, seven days later, the patient's condition did not admit of more than removal of a small portion of the tumour in the region of the internal meatus. Thirty days later she died of purulent meningitis.

Post-mortem.—An egg-shaped tumour, about 42 mm. by 39 mm., occupied the right cerebello-pontine angle.

Histologically this consisted of a fibro-glioma. The growth, there was good reason to believe, had commenced in that part of the acoustic nerve immediately within the internal meatus, which latter was enlarged. It was most remarkable that neither the facial, the trigeminal nor the sixth nerve were affected during life as they were in such immediate relation with the tumour.

This case and other published records of similar cases are discussed in detail, and the authors are certainly to be congratulated on their most exhaustive account, of which this report forms only a very meagre abstract.

Alex. R. Tweedie.

Vergues, Dr.—The Ear and Typhoid Fever. “*Rev. Hebdom. de Laryngol., d'Otol., et de Rhinol.*,” September 28, 1912.

This paper is based on the study of the ear complications which were met with during an epidemic of typhoid fever in 1909 in the naval hospital at Cherbourg. Out of a total of 359 cases of typhoid fever, ear complications arose in 29 cases, *i. e.* 8.07 per cent. In all these 29 cases sero-diagnosis had been positive.

(1) The external ear was affected in two of the cases. Furunculosis is the most common external ear complication. It is usually staphylococcal, and is comparable to the furunculosis which is met with in other parts of the body during typhoid fever. Herpes has also been described. Gangrene of the auricle is rare. Like the gluteal bed-sore, it occurs in very feeble patients, and is due to prolonged pressure and debility.

(2) Otitis media accounted for 26 cases of ear complication, *i. e.* 7.2 per cent. of the total. 2.7 per cent. were acute catarrhal cases. This type of case presents no unusual feature. In 4.4 per cent. the otitis media was suppurative. In the acute suppurative cases there is a rise of temperature, but pain is rarely a marked symptom. The perforation is usually single, of medium size, and almost always antero-inferior. The complication occurs most frequently during the stage of recession of the typhoid fever. Chronic middle-ear suppuration is, in most cases, a sequel of the acute type, but may be chronic from the first. The onset is characterised by a complete absence of reaction, and the condition is often discovered by accident.

The bacteriology was investigated in five of these suppurative cases. In none was Eberth's bacillus demonstrated. *Bacillus coli*, streptococcus, staphylococcus and diplococcus were the organisms found. These otites, then, should apparently be classed as paratyphoid lesions.

The prognosis in the catarrhal cases is excellent. They may, however, become chronic, with adhesion formation, or they may become purulent. In the suppurative cases the outlook is also, generally speaking, favourable. There may, however, be some diminution of the hearing distance.

Further, the suppurative cases tend to run a subacute or almost chronic course. The patient is also exposed to the risk of the ordinary complications of suppurative otitis media. Lermoyez considers that mastoid suppuration is an almost invariable accompaniment of these otorrhœas. The degree of severity of the typhoid fever seems to have no bearing on the occurrence of otitis media, nor on the gravity of the otitis when it does occur.

The usual route of infection is from the naso-pharynx *via* the Eustachian tube. Bucco-pharyngeal ulceration, dryness of the mouth interfering with deglutition and diminished resistance of the organism are all factors in the causation. Pre-existing pharyngeal and nasal lesions are predisposing causes.

Treatment is, in the first place, prophylactic—gargles, antiseptic washes, etc. Any pharyngeal lesions which appear should be energetically treated. Once middle-ear suppuration has occurred it should be dealt with on ordinary principles. Any pre-existing nasal or pharyngeal trouble should be attended to as soon as the patient's general condition permits.

(3) Otitis interna is a rare complication. It occurred in only one of the 359 cases. Attacks of slight severity no doubt occur often, but are not recognised owing to the debilitated state of the patient. This complication arises when the fever is at its height, and may be due to hyperæmia, hæmorrhage or serous effusion in the labyrinth.

The only suggestions for prophylactic treatment are the avoiding of quinine and salicylic acid. For the lesion itself, once it has occurred, Hill recommends iodide and mercury with subcutaneous injections of pilocarpine.

John M. Darling.

MISCELLANEOUS.

Feldt, A.—The Treatment of Tuberculosis with Gold. "Deutsch. med. Woch.," No. 12, 1913.

On injection into animals cantharidin causes a local reaction in the shape of a serous infiltration at any existing inflammatory focus, whether tuberculous or otherwise. It was suggested to the author by Prof. Spiess, who had observed this reaction in the human larynx, that cantharidin, although itself without bactericidal power, might be employed to convey substances possessing such power through the blood-stream to the tuberculous focus.

It was necessary in the first place to reduce the marked toxicity of cantharidin, and this was accomplished without diminishing its affinity for tuberculous foci, by forming a new æthylendiamine compound. The latter was then combined with various salts of gold, which are said to be the most powerful destroyers of tubercle bacilli at present known, their virtue being due, as the author was able to prove, to the gold itself and not to the substances with which it unites to form salts.

Animal experiments carried out with the compounds thus obtained gave the following results. Guinea-pigs and rabbits about a month after injection with either human or bovine bacilli showed on subcutaneous or intravenous injection of the gold-cantharidin compound a very marked local reaction of all the affected organs. The author attributes this reaction to destruction of the bacilli in the periphery of the tuberculous foci with liberation of their contained toxins—in fact, a tuberculin reaction resulting from bacterial destruction.

This focal reaction following injection of gold preparations may therefore be termed the "secondary tuberculin reaction."

Referring to the curative results of his experiments on guinea-pigs and rabbits, the author states that intravenous injection in tuberculous rabbits not only prolonged life for many months, but even brought about a permanent increase of weight. The animals received seven injections during a period of two months. They were killed five months later and the lungs then showed healed tuberculous foci.

The result in guinea-pigs treated by *subcutaneous* injection was negative, the gold preparations being reduced and the gold fixed locally, so that it failed to reach the bacilli in sufficient concentration. The injections also caused much local necrosis. A further hindrance to prolonged treatment with gold preparations consists in the observed fact that the bacilli after a time become "gold-fast," and therefore much less easily destroyed by the compounds in question.

If the latter can be combined with some agent which will overcome this acquired insusceptibility, a satisfactory remedy for tuberculosis may be the result.

Clinical observations will be given later by Spiess at the forthcoming International Congress of Medicine. Thomas Guthrie.

REVIEWS.

The Causes leading to Educational Deafness in Children, with Special Reference to Prevention. By MACLEOD YEARSLEY, F.R.C.S. Eng. London: P. S. King & Son, Orchard House, Westminster, 1912.

This pamphlet, the reprint of a series of articles published in the *Lancet*, consists of a careful statistical analysis of the histories of no fewer than 2197 deaf children. In the past, the author reminds us, statistical inquiry of this description has been vitiated by the fact that nearly all the data have been made up of the observations of lay, and very often uneducated people, and Yearsley's first care has been to strengthen his foundations by checking with his own observations "the replies given by parents." In spite of this, however, as the author himself says, much of the information supplied is of questionable value. If, for example, we turn to the group entitled "congenital deafness," we find that the numbers given largely depend—as, indeed, they must depend—upon the impressions of people who have never been trained to observe accurately, and that, moreover, these impressions concern the date when deafness is first noticed in an infant—and this even expert observers often find difficult to determine. Indeed, it is not too much to say that the very fact of "congenital deafness" might even be altogether doubted were it not that the existence of other deaf relatives in a family proves its reality as a hereditary defect appearing probably at an early stage in the development of the individual. We hasten to add that this difficulty is quite clearly appreciated by the author (p. 7).

We should like at this point to draw attention to the expression "hereditary (or congenital) deafness," as a term devoid of precision. Science no longer speaks of "hereditary *blindness*," or "congenital *lameness*." The fact is, of course, that we are here faced with a lacuna in our pathology. What and where is the inherited lesion which induces deafness? In short, despite several suggestions and investigations, this branch of otology is still shrouded in darkness.

With regard to the group of "congenital deafness" in which the family history shows no other deaf-born relatives, but contains instances

of divers other defects, mental or physical, the author furnishes us with the detailed characteristics of several families which may belong to such a type. But in order that the significance and value of these family defects as correlatives to the ear defect might be precisely estimated, it would have been better to have adduced also the histories of an equal number of other families, as controls, taken at random from the same social strata.

Critical considerations such as these seem to us to throw a large element of doubt upon the value of the statistical method of inquiry into the ætiology of infantile deafness. Familial statistics in general, for that matter, seem at present to be still under the cloud of the recent controversy between Sir Victor Horsley and Prof. Karl Pearson.

So much for criticism. It is with very different feelings that we turn to those other sections of the work in which the author's own observations form the groundwork of his conclusions. In the section upon the influence of syphilis upon the genesis of infantile deafness, for example, every reader will heartily sympathise with the author in his impeachment of a civilisation whose sole prophylaxis consists in moral suasion, and very little even of that! We fear, however, that the remedies proposed by the eugenists would be rather difficult of application in this slipshod, easy-going world of ours. But to discuss that aspect of the subject would carry us far beyond our present limits.

Another section of the work which enlists our support is that in which Yearsley pleads for the better education of the medical students in the prophylactic treatment of deafness. It is no exaggeration to say that a large number of deaf people would have been spared their affliction if their medical attendants had been trained to pay more attention to those infantile disorders which lead to deafness in later life.

We conclude by commending the point and force with which the author expresses himself, and by extolling the enthusiasm which he displays in his labours in this arid corner of the vineyard.

Dan McKenzie.

Die Untersuchung der oberen Luftwege: Ein Vortrag zur Einführung in die Moderne Rhino-Laryngologie für Aerzte und Studierende. Von Dr. P. H. GERBER, A.O. Professor und Direktor der Königlichen Universitäts-Poliklinik für Hals und Nasenkrankheiten zu Königsberg i. Pr. Mit 49 Text-Abbildungen und 12 Abbildungen auf 4 Tafeln. Würzburg: Verlag von Curt Kabitsch, 1913. Price 2 marks.

As the title implies, this is an introductory lecture on the examination of the upper air-passages which Prof. Gerber delivered before the *Verein für wissenschaftliche Heilkunde* at Königsberg, embellished by the incorporation of a variety of excellent diagrams and photographs.

The author disclaims any novelty for his remarks and illustrations, but the successful radiography of a salivary calculus and of the larynx—in the latter case a sensitive film was inserted by Réthi behind the larynx in the hypopharynx and œsophagus—is surely new; it is to the reviewer at all events.

Dan McKenzie.

Eye-strain in Every-day Practice. By SYDNEY STEPHENSON, M.B., C.M.Edin., D.O.Oxon., F.R.C.S.Edin., Ophthalmic Surgeon to the Queen's Hospital for Children, London; Editor of *The Ophthalmoscope*. Ophthalmoscope Press, 1913. Price 3s. 6d. net.

This little book, consisting of a collection of published papers and including the Middlemore post-graduate lecture delivered by the author

at the Eye Hospital, Birmingham, in 1910, contains an amount of information which should prove most useful to the family physician. In dealing with headaches and asthenopic symptoms, in the early pages of the book, attention is drawn to an important fact, frequently overlooked, that errors of refraction may exist, even with a visual acuity represented by $\frac{6}{6}$ as tested by Snellen's types.

Later on (p. 34) the necessity of accustoming the eyes to the wearing of lenses correcting errors of refraction, especially astigmatism, is emphasised: too often are we aware of glasses being thrown aside, the patient being convinced that they "do not suit," or that he "can see better without them."

There are chapters on "Habit-spasm," "Pseudo-papillitis," "Eye-strain simulating Grave Cerebral Lesions" containing information that should prove of service to the physician confronted by cases with a train of symptoms, answering to the examples given, and which have hitherto resisted his endeavours at alleviation.

The book is well printed and easily readable, the only typographical error noticed being in an expression of visual acuity on page 54. Should the author later on contemplate a second edition, we would suggest his adding to the list of headache groups on page 14 those of nasal origin—a not inconsiderable number.

H. H. B. Cunningham.

ADDENDUM TO THE CLINICS OF BRITAIN FOR DISEASES OF THE THROAT, NOSE, AND EAR.

Aberdeen Dispensary (Ear, Nose and Throat Clinic). Inst. 1880.

Medical Officer.—J. Mackenzie Booth, C.M., M.D., M.A.

Out-patients.—Tuesday and Friday, 3.15 p.m.

Operations.—Major and minor, Wednesday, 3.15 p.m.

We very much regret the omission of Dr. Mackenzie Booth's Clinic from the list published in the August number of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

NOTES AND QUERIES.

Sir StClair Thomson has been elected an honorary member of the Società Italiana di Laringologia e Otologia.

X. Y. Z. writes: "Can any of your readers supply me with *authentic and reliable* information about this new re-education method of treating deafness? I am constantly being asked by patients whether there is anything in it. What I want is the opinion of some reliable man who has tried it."

Vaccine Treatment of Otorrhœa.—In the medical supplement to the annual report for the year 1912 of the Metropolitan Asylums Board, Dr. A. Anderson reports the results of treating thirty-seven cases of otorrhœa with autogenous vaccines, in all of which the disease had proved intractable to local treatment. He found that the number of successes and the time taken to cure them showed no improvement on the average of cases not treated by vaccines. The great difficulty in the vaccine treatment of otorrhœa lies in the fact that the predominant organism cannot readily be determined.—D. M.

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